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THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

Edited by

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JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

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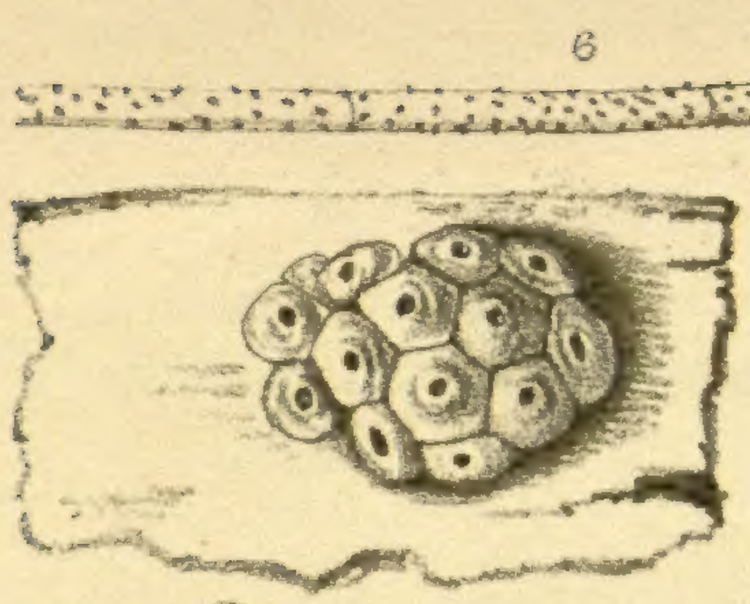
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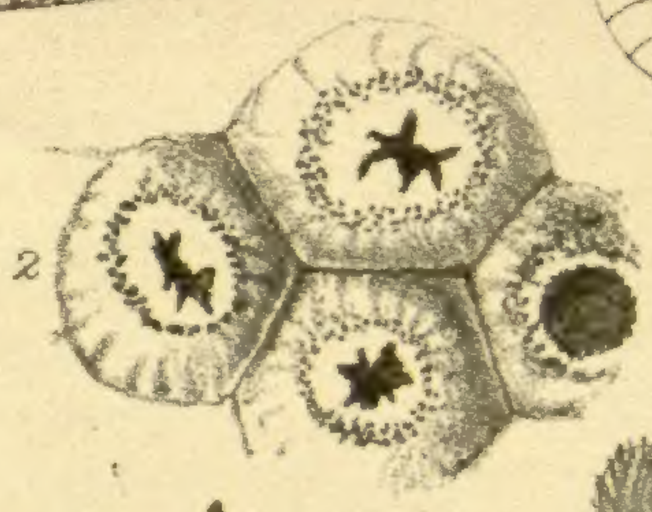
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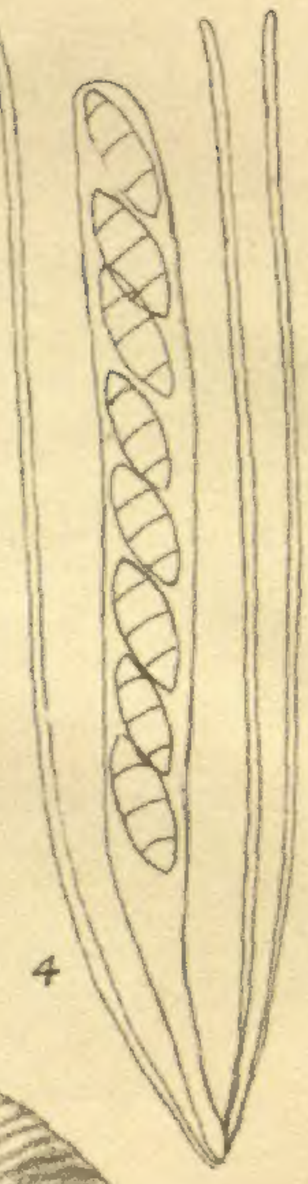
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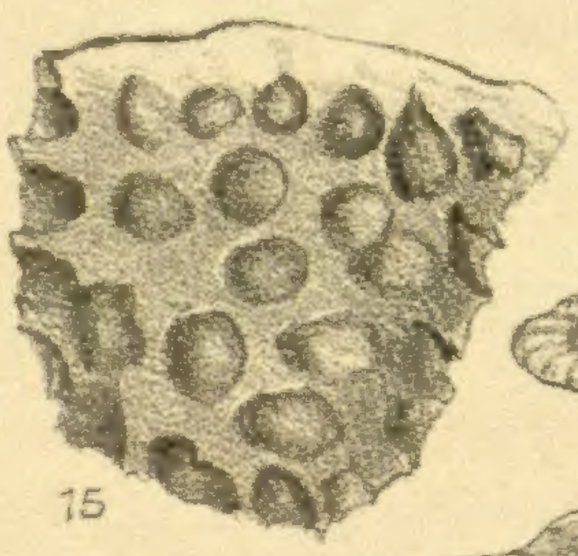

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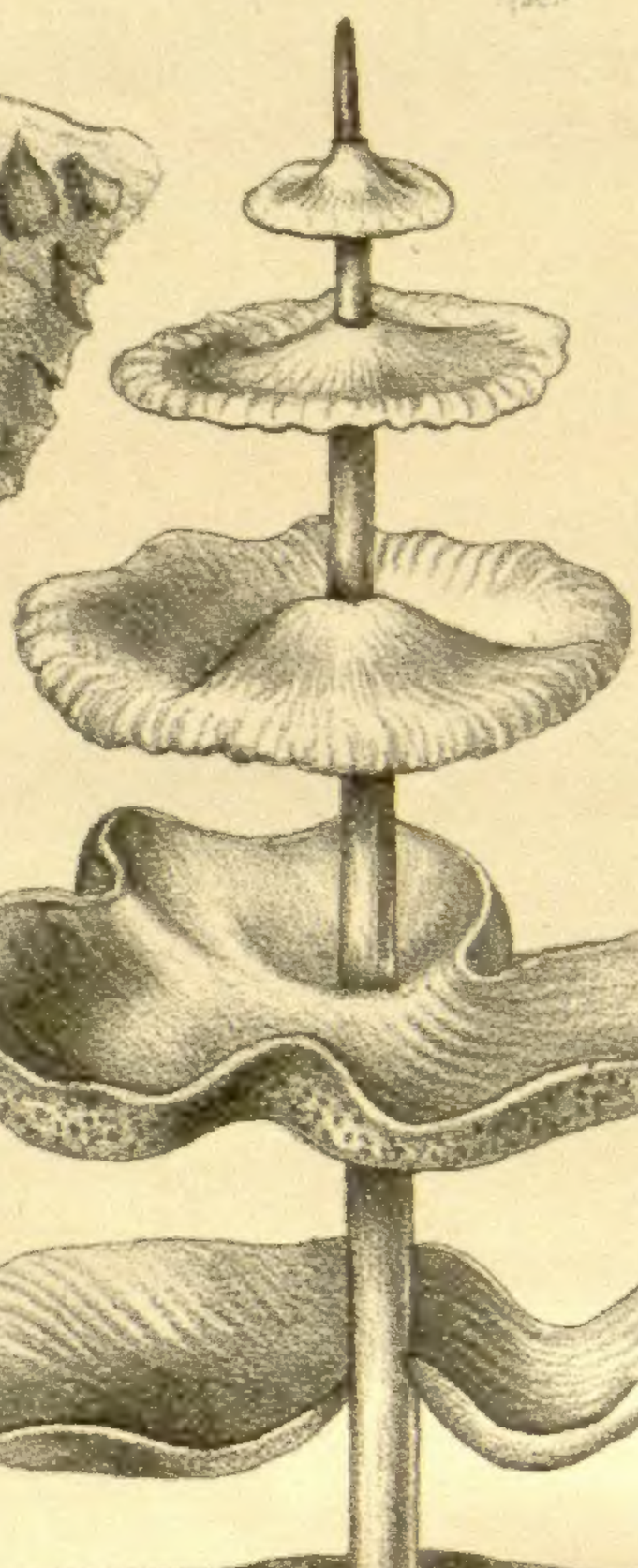

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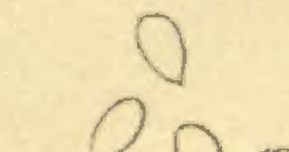
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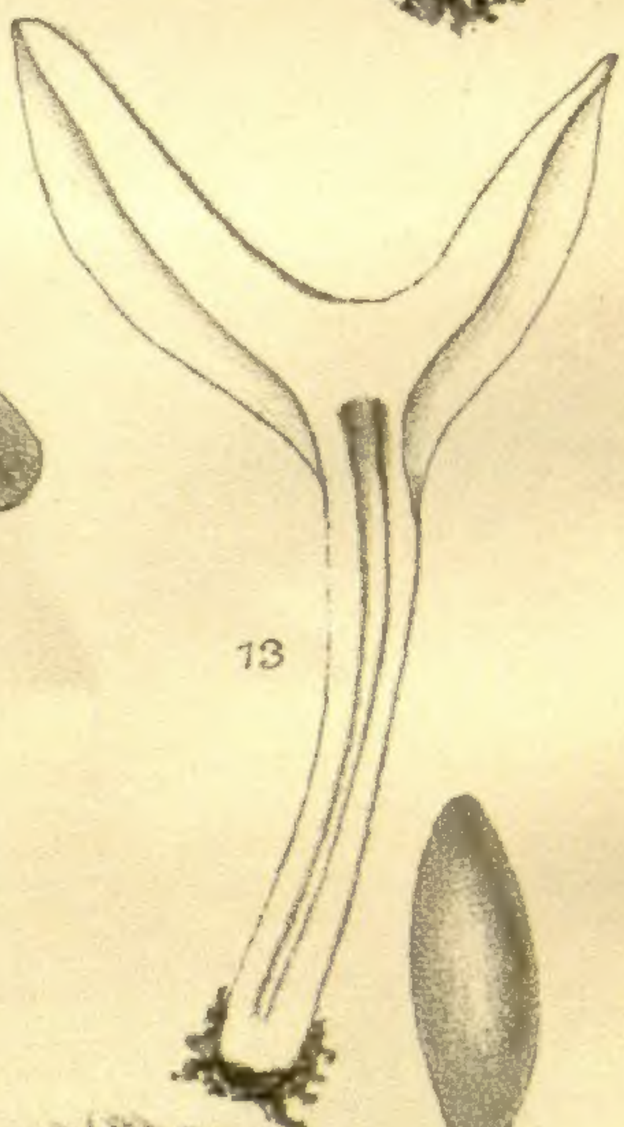

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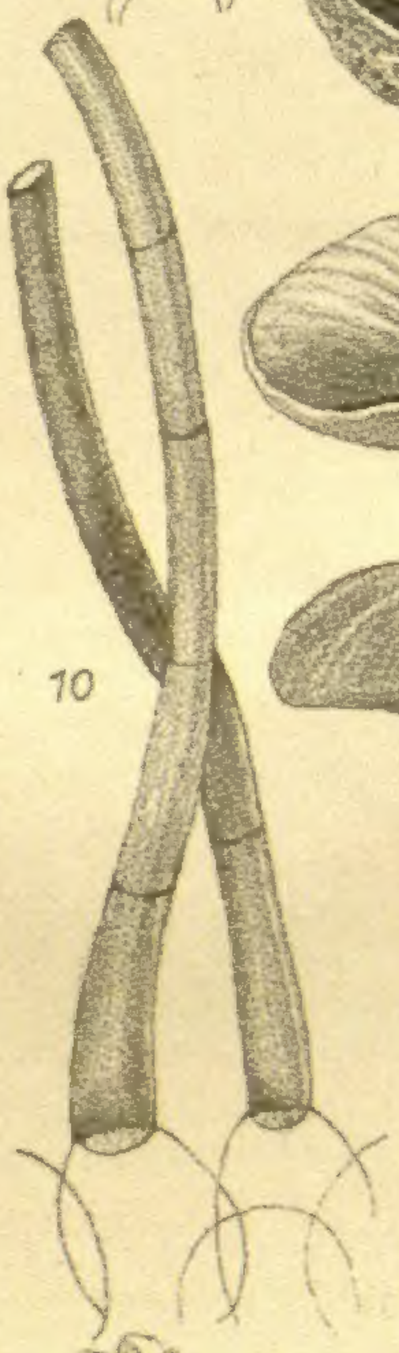



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G.Massee del. R.Morgan lith.

West, Newman imp.

Madagascar Fungi.

THE
JOURNAL OF BOTANY
BRITISH AND FOREIGN.

NEW FUNGI FROM MADAGASCAR.

By George Massee.

(Plate 300).

MYCODENDRON Mass. (nov. gen.), (figs. 14–16).—Stem erect, central, elongato-conical, expanding at the base into an irregular disc; pilei several, imbricated on the stem, distant, acropetal in development, circular or irregularly reniform, thin, subgelatinous; hymenium inferior, tuberculose or with sinuous nodulose ridges showing a radial tendency of arrangement; basidia tetrasporous; spores continuous, brown.

A very remarkable genus and evidently normal, as two fine specimens in an excellent state of preservation are in the Kew Herbarium. The stem is erect, tapering upwards, and bearing several superposed circular pilei separated by elongated internodes, and becoming smaller upwards. An affinity with the genus *Merulius* is indicated by the subgelatinous substance, plicate hymenium and brown spores.

Mycodendron paradoxa, Mass. (n. sp.), (figs. 14–16).—Stem erect, central, tapering upwards, solid, smooth, brown, 6–9 centim. high, 3–4 mm. diameter at the base; pilei 4–6 in number, circular or reniform, situated at about equal distances apart, the lowest 4 centim. in diameter, becoming smaller towards the apex, thin, subgelatinous, upper surface rugulose, brown; hymenium inferior, brown, plicato-nodulose; basidia clavate, aseptate, tetrasporous; sterigmata filiform, short; spores elliptic-oblong, continuous, smooth, brown, 7 × 4 μ; paraphyses clavate, filled with brown granules at the apex.

On wood. Madagascar. (Baron).

A peculiar species, resembling in habit *Cladonia verticillaris*.

The superposed pilei are distinctly acropetal in development.

Agaricus (Clitocybe) **pachycephalus** Mass. (n. sp.), (figs. 11–13).—Pileus at first convex, becoming depressed in the centre, glabrous, shining, margin finely striate when mature, pale grey, becoming paler towards the margin, 2–3 centim. diameter, flesh

white, compact, 4–5 mm. thick, becoming rather thinner at the margin; gills white, thin, crowded, 3–4 mm. broad, slightly decurrent; spores elliptic-oblong with a minute oblique apiculus at the base, white, 7–8 × 4 μ; stem curved, slightly attenuated downwards, hollow, white, smooth, 2–3 centim. long by 3 mm. thick.

On the ground. Madagascar. (Baron). Type in Herb. Kew.

Solitary or in clusters of two or three.

Bulgaria trichophora Mass. (n. sp.), (figs. 7–10).—Solitary, sessile, subgelatinous, suborbicular, becoming thin towards the involute margin, every part dark brown, the outside of the excipulum densely covered with very long, cylindrical, septate, sinuous, dark brown hairs 7–8 μ. diameter; hymenium convex, even; asci cylindrical, abruptly attenuated at the base: spores 8 in an ascus, continuous, dark brown, narrowly elliptical, smooth, 42–45 × 12–14 μ.; paraphyses numerous, cylindrical, slightly incrassated at the tip, which contains brown granules, septate, 4–5 μ. thick.

On wood. Madagascar. (Baron). Type in Herb. Kew.

A large and very beautiful species, remarkable amongst the *Bulgarieæ* in the densely strigose exterior of the excipulum. Probably erumpent. From 1½ to 2 in. across.

Cenangium congestum Mass. (n. sp.), (figs. 1–6).—Densely crowded on a thin stroma, forming whitish, irregular patches, ·5–1 centim. across; cups sessile, horny, circular or irregular from mutual pressure, spherico-depressed, at first closed then opening by the irregular rupture of a thin whitish diaphragm, externally brown, densely pruinose with particles of oxalate of lime; hymenium concave, pale; asci cylindrical, attenuated at the base; spores eight in an ascus, uniseriate, elliptic-fusiform, triseptate, smooth, colourless, 16–18 × 8 μ.; paraphyses numerous, filiform, aseptate, equal in length to the asci, 1·5–2 μ. diameter.

On bark. Madagascar. (Baron). Type in Herb. Kew.

The white clusters are very conspicuous on the bark, and under a pocket-lens bear some resemblance to a *Pertusaria*. The diaphragm closing the mouth of the cup is eventually ruptured and forms an irregularly toothed fringe; the hyphæ of which it is composed are studded with particles of lime.

DESCRIPTION OF THE FIGURES ON PLATE.—Fig. 1, *Cenangium congestum;* a group of plants, × 25. 2, group of same, × 100. 3, section of same, × 100. 4, ascus and paraphyses of same, × 400. 5, spores of same, × 400. 6, hypha of same with particles of oxalate of lime from the diaphragm. 7, *Bulgaria trichophora;* section, nat. size. 8, ascus and paraphysis of same, × 300. 9, spore of same, × 400. 10, portions of hairs of same, × 300. 11, *Agaricus* (*Clitocybe*) *pachycephalus*, nat. size. 12, spores of same, × 400. 13, section of same, nat. size. 14, *Mycoderma paradoxa*, nat. size. 15, portion of hymenium of same, × 25. 16, basidia, spores, and paraphyses of same, × 400.

FERNS OF NORTH-WEST MADAGASCAR.

By J. G. Baker, F.R.S.

The Herbaria of Kew and the British Museum have lately obtained, through H. Grose Smith, Esq., of Harley Street, London, sets of ferns collected by Mr. J. T. Last in the north-west of Madagascar, which contain the following, in addition to a number of other widely-spread species. The collection was made in two different localities. The first and most interesting packet came from the Bé Kilus Mountains, and contains the following species:—

33*. **Cyathea Lastii,** n. sp. Frond ample, tripinnate, moderately firm in texture, green and glabrous on both surfaces; rachises naked, yellowish brown. Pinnæ oblong-lanceolate, 2 ft. or more long, 8–9 in. broad; pinnules lanceolate, caudate, sessile, ¾ in. broad, cut down to the rachis into lanceolate-crenate segments ⅛ in. broad. Veins 9–10-jugate, very distinct, forked. Sori costular, not reaching the tip of the segments. Indusium large, firm, cup-shaped, with an entire truncate throat.—Allied to the West Indian *C. Serra* Willd.

64*. **Alsophila simulans,** n. sp. Frond oblong-deltoid, bipinnate, moderately firm in texture, green and naked on both surfaces; rachises drab-brown, naked. Pinnæ lanceolate, sessile, a foot long, 2 in. broad, cut down to the rachis into entire obtuse linear-oblong pinnules ⅙–¼ in. broad. Veins 20–30-jugate, close, very distinct, forked. Sori crowded, costular, not reaching the tip of the segments. Receptacle densely pilose.—Habit and cutting of *Cyathea Pervilleana* Fée and, *C. quadrata* Baker.

64*. **A. castanea,** n. sp. Frond ample, tripinnate, firm in texture, green and glabrous on both surfaces; rachises castaneous, slightly furfuraceous, and scattered over with small linear paleæ. Pinnæ oblong-lanceolate, a foot or more long, 3–3½ in. broad; pinnules lanceolate, sessile, ½ in. broad, cut down to the rachis into linear-oblong tertiary segments. Veins 8–9-jugate, very distinct, forked. Sori filling the whole under surface of the tertiary segments, which are smaller than those of the sterile frond, 10–12 to a segment.—Allied to *A. Boivini* Mett.

Dicksonia madagascariensis Kunze. An authentic specimen lately seen shows this to be identical with *D. hypolepidoides* Baker. It stands on the boundary-line between *Dicksonia* and *Davallia*, and was classed by Moore as a *Microlepia*.

7*. **Lindsaya oxyphylla,** n. sp. Rootstock slender, short-creeping; basal paleæ linear, minute, bright brown. Stipe slender, naked, reddish brown, 4–6 in. long. Frond lanceolate, simply pinnate, bright green, moderately firm, 8–12 in. long, 12–21 lines broad. Pinnæ multijugate, sessile, rhomboid, obscurely crenulate, narrowed to an upcurved point, ½ in. broad. Veins close, fine, simple, flabellate. Sori interrupted. Indusium glabrous, very narrow.—Allied to *L. cultrata* Sw.

L. ensifolia Sw.

ADIANTUM RENIFORME var. CRENATUM, n. var. Frond deeply crenate all round the fertile outer margin, with a sorus with a very reniform indusium at the bottom of each indentation. Of this very distinct species two forms are already known, the type in Madeira and Teneriffe, *A. asarifolium* Willd. in Mauritius and Bourbon; this is a third from Madagascar.

Pteris palmata Willd. Sterile frond 3-lobed, not more than $\frac{1}{2}$–$\frac{3}{4}$ in. long and broad.

52*. **Pteris** (DASYOPTERIS) **cordifolia**, n. sp. Tufted. Stipe of sterile frond 3–4 in. long, naked, glossy, brown-black. Sterile frond simple, cordate-ovate, chartaceous, bright green and glabrous on both surfaces, 4–5 in. long, deltoid at the apex with broadly-rounded basal lobes. Veins distinct, erecto-patent, anastomosing copiously in narrow areolæ without any free included veinlets. Fertile frond with a longer stipe and hastate lamina with three lanceolate lobes, the end one the largest, the two basal ones more or less divaricating. Sorus broad, continuous. Indusium narrow, glabrous. — A very distinct novelty, allied to the Brazilian *P. sagittifolia* Raddi.

P. laurea Desv.? Texture more rigid than in the type, and veins usually free.

P. tripartita Sw.

Lonchitis pubescens Willd.

Lomaria attenuata Willd. var. *diversifolia*.

20*. **Asplenium** (EUASPLENIUM) **longisorum**, n. sp. Root-stock slender, short-creeping; basal paleæ lanceolate, nearly black. Stipes contiguous, nearly black, wiry, naked, reaching a length of nearly a foot. Frond ovate-acuminate, 5–6 in. long, entire or furnished with two lateral cusps, broadly rounded at the base, sub-coriaceous, bright green, glabrous. Midrib distinct only towards the base of the frond; veins fine, close, flabellate, free. Sori narrow, running along the veins up to a short space from the edge. Indusium very narrow, glabrous. — Allied to *A. Hemionitis* L. Texture of *A. macrophyllum* and *A. falcatum*.

50*. **Asplenium** (EUASPLENIUM) **pachysorum**, n. sp. Root-stock not seen. Stipe slender, fragile, naked, 6–8 in. long. Frond oblong-deltoid, simply pinnate, moderately firm in texture, green and glabrous on both surfaces, with a long lanceolate end-pinna rooting at its tip. Side pinnæ 1–5-jugate, lanceolate, sessile, acuminate, obscurely crenulate, 4–6 in. long, about an inch broad, nearly equal at the base. Veins lax, ascending, simple or forked. Sori stout, running along the veins from the midrib nearly to the edge. Indusium narrow, persistent, glabrous. — Closely allied to West African *A. longicauda* Hook., and *A. emarginatum* Beauv.

A. anisophyllum Kaulf.

A. cuneatum Lam.

A. (*Athyrium*) *nigripes* Blume, var. *dissectum* Moore.

Nephrodium subquinquefidum Hook.

155*. **Nephrodium** (LASTREA) **granulosum**, n. sp. Frond large, membranous, deltoid, decompound, green on both sides, hairy only on main rachises above, finely pubescent and granular all

over beneath. Lower pinnæ oblong-lanceolate, a foot or more long; pinnules sessile, lanceolate, an inch broad, cut down to the rachis into oblong obtuse crenate tertiary segments. Veins forked opposite the lobes of the tertiary segments. Sori distant from the midrib, one to each lobe of the tertiary segments. Indusium reniform, glabrous, persistent. — Allied to *N. magnum*, *N. Boivini*, and the West Indian *N. amplum*.

N. pennigerum Hook.
N. cicutarium Baker.
Polypodium Gilpinæ Baker.
P. adnascens Sw.

339*. **Polypodium** (Pleuridium) **Lastii,** n. sp. Rootstock wide-creeping, epigæous, $\frac{1}{6}$ in. diam.; paleæ small, brown, lanceolate. Stipes slender, nearly naked, 5–6 in. long. Frond oblong-lanceolate, acute, entire, membranous, glabrous, 9–12 in. long, $2\frac{1}{2}$–3 in. broad at the middle, narrowed suddenly at the base. Main veins slender, wavy, $\frac{1}{2}$ in. apart, distinct from the midrib nearly to the edge; intermediate veins forming copious hexagonal areolæ with free included veinlets. Sori round, superficial, forming two irregular rows between each main vein.—Nearly allied to the Indian *P. membranaceum* D. Don.

Antrophyum reticulatum Kaulf. Widely spread in Tropical Asia and Polynesia. New to Africa.

Acrostichum spathulatum Bory.

43.* **Acrostichum** (Elaphoglossum) **tricholepis,** n. sp. Rootstock short-creeping; basal paleæ lanceolate, brown, membranous. Stipe of sterile frond 2–3 in. long, densely crinite. Sterile frond lanceolate, entire, 3–10 in. long, 1–$1\frac{1}{2}$ in. broad at the middle, moderately firm, bright green, densely ciliated on the margin and midrib with dark brown linear or linear-subulate paleæ. Veins rather ascending, lax, forked. Fertile frond small, oblong, densely ciliated on the margin with long subulate paleæ.—Midway between *A. scolopendrifolium* and *A. villosum*.

A. virens Wall.
Lygodium Kerstenii Kuhn.
Selaginella concinna Spring.

The following species were gathered by Mr. Last about the sources of the Sambiran River, *viz.*:—

Davallia mauritiana Hook.
Lindsaya plicata Baker.
L. heterophylla Willd.
Pteris phanerophlebia Baker.
P. triplicata Ag.
P. biaurita L.

61*. **Pteris** (Litobrochia) **acuminata,** n. sp. Rootstock not seen. Stipe long, naked, slender, stramineous. Frond oblong-lanceolate, simply pinnate, moderately firm in texture, bright green, glabrous, $\frac{1}{2}$–1 ft. long, 3–9 in. broad. Pinnæ 4–7-jugate, subsessile, lanceolate-acuminate, $\frac{1}{2}$–$\frac{5}{8}$ in. broad, all entire, those of the sterile frond crenate towards the tip. Veins forming copious

areolæ without any free included veinlets. Sorus broad, continuous. Indusium glabrous.—Very near *P. lanceæfolia* Agardh.

Asplenium hirtum Kaulf.
A. bipartitum Bory.
A. sylvaticum Presl.
Nephrodium albo-punctatum Desv.
N. subquinquefidum Hook.
N. Arbuscula Desv. New to Madagascar.
N. cucullatum Baker.
N. truncatum Presl.
N. subtriphyllum Baker. New to Madagascar.

62.* **Polypodium** (Goniopteris) **oligophlebium,** n. sp. Root-stock woody, wide-creeping, ⅛ in. diam., with a few lanceolate brown membranous paleæ. Stipe slender, naked, 2–3 in. long. Frond oblong, simply pinnate, moderately firm, green, glabrous, a foot long, 9–10 in. broad. Pinnæ 5–6-jugate, distant, sessile, lanceolate, obscurely crenate, an inch broad at the middle. Main veins distinct, erecto-patent; veinlets 3–4-jugate. Sori small, globose, superficial.—Near the Queensland *P. pœcilophlebium* Hook.

P. proliferum Presl.
Acrostichum sorbifolium L.
A. virens Wall.
A. Humblotii Baker.
Lygodium lanceolatum Desv.
Osmunda regalis L.
Ophioglossum nudicaule L. fil.
O. pendulum L.

EPILOBIUM NOTES FOR 1890.

By the Rev. E. S. Marshall, M.A., F.L.S.

In the South of England, last season was an unfavourable one for this genus. A mild winter was followed by a dry and ungenial spring, and in some spots where I had observed hundreds of plants in 1889 I now found but tens. Mould (or fungoid growth) was also present to a remarkable degree, often so much so as to render identification and collection impossible, particularly on light sandy soils, which constitute a large part of my own neighbourhood. My leisure has also been less than in previous years, and I have paid comparatively little attention to anything but supposed hybrids. In Scotland, however, Mr. Hanbury and myself observed some interesting crosses, one or two of them new to this country. Messrs. Druce, Hiern, and Miller, and Dr. Buchanan White have sent me specimens for determination. Prof. Haussknecht has again been kind enough to report on a selection from my gatherings. An asterisk denotes a form believed to be new to Britain.

Epilobium parviflorum Schreb. A state from Ainderby, N.W. Yorks, with pure white flowers (which I never saw before), was gathered by the Rev. W. Moyle Rogers and his son. A similar

state of *E. hirsutum* has been found in Herefordshire by Mr. W. W. Reeves.

f. *longifolia*. This is a very remarkable form, so named by Prof. Haussknecht, who says that he never saw it so well-defined before. I found it in several places by the Wey, between Elstead and Tilford, Surrey; and, from the size, habit, leaves, glabrescence, faintly-lined stem, and but shortly and erectly lobed stigmas, referred it with some confidence to *adnatum* × *hirsutum*. It certainly differs widely from our ordinary forms of the species, and requires further study; the inflorescence, however, looks quite typical when dried; nor did I see *E. adnatum* growing on the spot, though it occurs at no great distance. The plant attains a height of about four feet, with a stem as thick as a swan's quill near the ground. The lower leaves are from four to six inches long, strap-shaped, sharply and irregularly toothed (almost serrate), nearly glabrous above, $\frac{1}{2}$–$\frac{5}{8}$ in. at their broadest part, gradually tapering to an acute point in the upper half, and bearing considerable resemblance to those of *E. adnatum*.

E. LAMYI F. Schultz. I again found this species in good quantity, and unquestionably native, in the chalk-woods between Chilham and Crundall, E. Kent. When once known, it is easily distinguished from *E. adnatum*, even in the spring-rosette stage, the leaves being then carinate and subglaucous, instead of almost flat, and yellow-green.

E. OBSCURUM Schreb. Ascends to fully 1500 ft. on Ben More of Assynt, W. Sutherland. The frequent confusion between it and *E. palustre* in herbaria is remarkable.

E. PALUSTRE L. The striking f. *lavandulæfolia* Lec. & Lamotte (var.) occurs near Inchnadamph, growing to a height of 16 in., with leaves only $\frac{1}{10}$ to $\frac{1}{8}$ in. broad.

E. ALSINEFOLIUM Vill. Descends to 450 ft. near Inchnadamph, and *E. anagallidifolium* Lam. to 500 ft.

*E. ADNATUM × MONTANUM (*E. Beckhausii* Hausskn.). Near Tilford, Surrey, with the parents. This was named "*obscurum*, f. *annua*" by Prof. Haussknecht, but I am quite convinced that the plant has nothing to do with that species. It was precisely analogous to specimens of *Lamyi* × *montanum* gathered at the same time, and assented to by him; and the obscurely-lobed stigmas clearly showed its origin, taken in combination with the yellowish green colour, shrunken capsules, and the toothing and shape of the leaves, some of which are slightly decurrent by their limb, as in *adnatum*. Each specimen was carefully examined before being put into press, and the series now under my eye seems to speak for itself. The divergence from the ordinary form may be due to the fact that in this locality *E. adnatum* has mostly very narrow leaves. Seven stations in Germany and Bohemia are given in the Monograph.

E. ADNATUM × OBSCURUM. Braunton and Bishop's Taunton, N. Devon (Hiern).

E. ADNATUM × PARVIFLORUM. Mr. Druce sends this from Uffington, Berks, in two forms; one intermediate, the other towards

parviflorum. A similar form to the latter occurs in wealden copses near Witley, Surrey.

E. ALSINEFOLIUM × ANAGALLIDIFOLIUM (*E. Boissieri* Haussk.). In mossy rills, descending Ben More of Assynt, from 1500 to 2000 ft., growing with the parents. Its only previous record for Britain was Glen Doll, Forfar. Known from half-a-dozen stations in Austro-Hungary, Savoy, the Sierra Nevada, and the Pyrenees.

*E. ALSINEFOLIUM × MONTANUM (*E. salicifolium* Facchini). A single specimen, in bud only, which was gathered by Dr. B. White last summer, at 1800 ft., on Ben Cleuch, Ochills, Perthshire, must, I think, be so named. The toothing and outline of the leaves point distinctly to *montanum*, and the *alsinefolium*-parentage is beyond question. The young capsules are grey with pubescence, but Haussknecht mentions a similar form. Dr. White did not notice *E. montanum* near, still there is no reason against its occurrence at that altitude. Recorded from several stations in the mountainous part of Central Europe.

E. ALSINEFOLIUM × PALUSTRE (*E. Haynaldianum* Hausskn.). Ben More of Assynt, at 1500 to 2000 ft.; in two forms, one intermediate, the other towards *palustre*. New to Scotland, but gathered by Winch in the Cheviots (Herb. Brit. Mus.!), and by Mr. J. G. Baker at Weltrope, in Durham. Known on the Continent from the Sierra Nevada, Pyrenees, Savoy, Tyrol, Carpathians, &c.

E. ANAGALLIDIFOLIUM × OBSCURUM (*E. Marshallianum* Hausskn.). I found and described this hybrid three years ago, and re-visited the station last July with Mr. Hanbury. The altitude was at first believed to be 1600 ft., but it is nearer 1100 ft. by aneroid. Our search fully confirmed Prof. Haussknecht's diagnosis. Both parents occur there, though not in great quantity; their offspring being much more abundant than either, and clearly showing its origin. As a rule, the plants are just intermediate, but some shade off in either direction. I shall be happy to supply specimens, as far as my duplicates will go.

*E. ANAGALLIDIFOLIUM × PALUSTRE (*E. dasycarpum* Fr.). Rills, Ben More of Assynt, from 1500 to 2000 ft. Found sparingly, and mostly in immature condition; but I feel quite certain of the parentage, and the name is confirmed by Prof. Haussknecht. Our visit was in mid-July, and by the end of the month a greater quantity would no doubt be recognisable. *E. alsinefolium* × *obscurum* is also likely to be discovered there.

E. HIRSUTUM × OBSCURUM (*E. anglicum* mihi). A specimen so named by Prof. Haussknecht was collected by the River Wey, above Elstead, and will be placed in the British Herbarium at South Kensington.

E. LAMYI × LANCEOLATUM. This came up in my garden last spring as a natural offspring of the two species cultivated close together. It is exactly intermediate, and only shows such divergences from the wild hybrid as shade and a richer soil will quite account for.

E. LAMYI × PARVIFLORUM. Woods on chalk, scarce, between Chilham and Crundall, E. Kent.

E. MONTANUM × OBSCURUM. In the same locality as the last. Also collected in 1865 by Mr. Hiern near the Wrekin, Salop, and in 1866 (*forma minor*) between Barnstaple and Ilfracombe, N. Devon.

E. MONTANUM × ROSEUM. Clapton Station, Middlesex, *Mr. Hanbury*! and also in his garden, where the two species occur as weeds. It came up in my own garden at Witley, where I have cultivated them.

E. OBSCURUM × PARVIFLORUM. Woods between Chilham and Crundall, E. Kent. A curious form, with quite amorphous stigmas, grows near Elstead, Surrey.

E. OBSCURUM × PALUSTRE. Authentic specimens of *E. ligulatum* Baker which I have seen are certainly this cross, as pointed out by Haussknecht. I have seen it this year at Inchnadamph, W. Sutherland; Milford and Worplesdon, Surrey; and specimens have been forwarded by Mr. Hiern from S. Molton, N. Devon, and by Dr. B. White from Corrie Ardran, Mid-Perth—a small alpine state approaching *palustre*, and very like one found by me in descending from Ben More of Assynt, at 1100 ft.

E. OBSCURUM × ROSEUM. Ditch near Withyham, E. Sussex (*Miller*!).

E. PALUSTRE × PARVIFLORUM. Between Churt and Thursley, Surrey.

*E. (OBSCURUM × PALUSTRE) × PALUSTRE (*teste* Haussknecht). Glen Lochay, Mid-Perth; Elstead, Surrey. This naming is, I think, correct; I had so queried some of the Elstead specimens. Triple hybrids, as in *Salix*, are perhaps not extremely rare; but their determination must in general be exceedingly critical and uncertain, and I doubt the expediency of giving them a permanent place in our list.

ROBERT UVEDALE.

By G. S. Boulger, F.L.S., F.G.S.

In the botanical literature of the close of the seventeenth and the beginning of the eighteenth century we frequently encounter the name of Dr. Uvedale, of Enfield. To most of us, however, he is only a name, so it may be worth while to collect together the scattered information which we have concerning him.

The following is Pulteney's somewhat meagre account * :—

"Dr. Uvedale lived at *Enfield*, where he cultivated a garden, which appears to have been rich in exotic productions. And although he is not known among those who advanced the indigenous botany of Britain, yet his merit as a botanist, or his patronage of the science at large, was considerable enough to incline Petiver to apply his name to a new plant, which Miller retained in his dictionary, but which has since passed into the genus *Polymnia*, of the Linnæan system; the author of which has nevertheless retained *Uvedalia* as the trivial epithet."

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* *Sketches of the Progress of Botany*, vol. ii. p. 30.

The records of Uvedale's name have been* traced back to the time of Henry III. Mr. Leveson Gower, to whom I am much indebted for assistance, writes as follows :—

"Of the origin of the name of Uvedale I cannot speak with certainty; in the earlier deeds it is generally written 'Ovedale' or 'D'Ovedale,' and subsequently 'Uvedale'; but in later times it underwent various changes. Mr. Albert Way (Arch. Journal, vol. xiii. p. 70), in an account of the seal of Margaret D'Ouvedale, says :—'The changes the name has undergone are curious. It has been converted into "Dounedale," "Downdale," "Dovedale," "Unedale," "Undal," "Udall," and so even into "Woodhall." Strange as this last may appear, it will be readily intelligible to those who are familiar with the provincial pronunciation of wood as "'ood.'" And a writer in the *Collectanea Topographica* (vol. v. 241–2), quoting from a manuscript found at Marrick Priory, says :—"This name hathe bene marveloselie changide bi what meanes i knowne not nor can finde owt except as i conjecture bi corrupcione of the comon people in pronownsing shorte the names of thinges, for thei call the name Woddall, and some call it Udall and some Wodhall and some have called it Unedale with a n; but truth is the right name is Uvedale."

The same writer in the *Collectanea* is further quoted by Mr. Leveson Gower as saying—"Sir William Woddall, president of Prince Arthur's cownsaile in Wales, didde affirme that the olde name of the Unedale cam out of the northe cuntrie first, which thing the said Sir William didde verifie to be trewe and that the howse of the Unedale was in ancient time attaintide in the northe parties."

John de Uvedale married the heiress of Sir John de Scures of Wickham, Hants, who died in the twenty-seventh year of Edward III., and thus Wickham came to the Uvedales. One of the family is said to have been the first patron of William of Wykham, and a shield of Uvedale and Scures arms with the motto "Tant que je puis," is on the vaulting of the Lady Chapel of Winchester Cathedral, and the full arms, crest and supporters are on the one remaining stone of Wickham Manor, now on the north wall of the College Chapel. The family, says Mr. Leveson Gower, (*op. cit.* p. 3) were "connected with the county of Surrey for about three hundred and fifty years—from A.D. 1304 until 1652. For nearly two hundred and fifty years—from A.D. 1304 to cir. 1540—they resided continuously at Titsey, being possessed of large estates in that neighbourhood, and elsewhere in the counties of Surrey, Sussex, Kent, Hampshire, and Norfolk. One of their principal seats was at Wickham, in the county of Southampton, at which they fixed their residence altogether, after the sale of Titsey to Sir John Gresham, Kt., *circa* 1540, and in later times a branch of the same family was settled at More Crichel, in Dorsetshire."

To the Hampshire branch of the family probably belonged Nicholas Udall, master of Eton, who by writing *Ralph Roister*

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* *Notices of the Family of Uvedale, of Titsey, Surrey, and Wickham, Hants.* By Granville Leveson Gower, M.P. Surrey Archæological Collections, 1865.

Doister ranks as the earliest of English comic dramatists. The John de Uvedale who married Sybilla de Scures had a grandson, Sir Thomas, who died in 1474, leaving two sons, Sir William Uvedale, of Wickham, who died in 1524, and Thomas, whose son, Sir Henry Uvedale, described as of More Crichel, Dorset, died in 1513. This Sir Henry had a son, Sir William, who died in 1542, leaving a son Francis, of Horton, who died in 1590. His son Thomas died in 1612, leaving a son, Sir William, and another, Richard, who died in 1656 or 1658, and was buried at Horton. This Richard married Johanna, daughter of Robert White, of Weymouth and Melcombe Regis, whose name seems to account for the introduction of the name Robert, not hitherto a family name, into the Uvedale pedigree. Their son Robert is described as of St. Margaret's, Westminster, and died in 1683, having had three sons: Thomas, born in 1641, who died young; Robert, the botanist; and another, Thomas, born in 1650. This branch of the family belonging to Dorsetshire, a great-grandson and namesake of the botanist contributed a fairly full account of his ancestors, with a pedigree, to Hutchins' *History of the County*.*

Robert Uvedale, son of Robert Uvedale, was born in the parish of St. Margaret's, Westminster, May 25th, 1642, and was baptized on the 31st of the same month at St. Margaret's.† Before he was seventeen he was educated at Westminster School (St. Peter's College), being thus a pupil of the celebrated Dr. Busby. Here he may very probably have had Locke and Dryden, with the latter of whom he afterwards collaborated, as senior contemporaries; and it was probably with reference to having been at Westminster School that Plukenet speaks of Uvedale and of Courten as "condiscipulus."‡ Of his school-days the only incident recorded is that at the funeral of Oliver Cromwell, in 1658, he snatched one of the escutcheons from the bier of the Protector, which was preserved in his family at least until 1794.§ Copies of his *Oratio Valedictoria, habita in Schola Westmonasteriensi*, 1659; of his *Epistolæ ad Electores*; and of *Verses read after Dinner at the Feast, Westminster College, May* 4, 1659, were in the possession of his great-grandson, Rev. Robert Uvedale. They were addressed, according to custom, to Dr. Wilkins, Master of Trinity College; Dr. Owen, Dean of Christ Church; Mr. Linet, Senior Fellow of Trinity, &c.‖

He was elected Scholar of Trinity College, Cambridge, 29th April, 1659, his name being then registered as Robert Udall¶; but

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* Ed. iii. vol. 3. p. 144 *et seq.*

† *Memorials of Westminster*, by Rev. Mackenzie Walcott, M.A., Lond. 1851, p. 158.

‡ *Phytographia*, tab. xxxii. *sub* fig. 6 (1691), and *Almagestum*, p. 36.

§ *Gentleman's Magazine* (letters from his great-grandson), vol. lxii. 114 and lxiv. 19.

‖ Robinson, *History of Enfield*, p. 110.

¶ *List of the Queen's Scholars of St. Peter's College, Westminster.* Collected by Jos. Welch. New ed. By an old King's Scholar [R. J. Phillimore]. Lond. 1852, p. 152. Uvedale is here erroneously described as "an eminent schoolmaster at Fulham."

when he graduated as B.A. in 1662, it was apparently entered as Uvedall.* He was elected Fellow in 1664, and is said to have been first a Divinity Fellow and afterwards a Law Fellow. The story goes that he had the singular honour of carrying his point against a no less powerful competitor than Sir Isaac Newton; the Master, Dr. Barrow, declaring in his favour on the ground that, as they were equal in literary attainments, he must give the prize to the senior. Uvedale is stated to have soon afterwards vacated his fellowship by marriage, and to have taken the school at Enfield.† Newton, however, was elected to a fellowship in October 1667, whilst Barrow did not become Master until 1672. Uvedale is stated by local historians to have come to Enfield between 1663 and 1665, and was certainly there at the outbreak of the plague in the latter year. The advowson of Enfield being in the possession of his college probably directed his attention to the place, and he seems, almost upon first going there, to have taken a lease of the manor-house, commonly called Queen Elizabeth's Palace, in order to supplement his salary as Master of the Grammar-school. The lease of the previous occupant of the Manor House expired in 1656. As Uvedale was fourteen years older than his wife, she was only eight years old when he first became a Fellow of Trinity, and it was probably not until about 1679 that he vacated his fellowship by marriage. In 1666 he proceeded M.A.

His wife was Mary, second daughter of Edward Stephens, of Cherrington, Gloucestershire, and granddaughter of Sir Matthew Hale. She was born in 1656, and died in 1740, having had three sons and five daughters.

Enfield Grammar-school, of which Uvedale was master, was founded in 1557 and restored in 1875. It adjoins the parish church (St. Andrew's), and is little more than a hundred yards from the manor-house.

This manor-house, which Uvedale took for his boarders, was a fine old mansion which had been mainly re-built in Elizabeth's reign, being, like many other houses of the time, on the plan of the letter E, *i. e.*, with two wings and a front central porch. A good deal of the building was pulled down in 1789 and 1792; but there are two views of it, and of the two fine carved mantelpieces, still remaining in it, in Robinson's *History of Enfield* (2 vols., Lond., 1823). There is also an engraving of the house in Lysons' *Environs of London*, vol. ii. Though reduced in size, the old house retains traces of its former splendour in a fine oak-panelled dining-room and drawing-room ceiling ornamented with crowns, roses, thistles and fleurs-de-lis. Both the carved over-mantels are now in the dining-room. It has continued to be a school from Uvedale's time, and is now, as the Palace School, in the hands of E. L. Hogarth, Esq., M.A., who kindly gave me all the information in his possession.

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* Luard, *Graduati Cantabrigienses*, where his sons and grandsons, &c., appear as "Uvedale."

† *Correspondence of Richard Richardson, M.D.*, Yarmouth, 1835, p. 15. Note by Dawson Turner.

The house seems to have been presented by Edward VI., in 1552, to his sister Elizabeth, who frequently stayed here for a time.*

Whether he was the inventor of the homely preventive of infection or not, it is related of Uvedale that during the outbreak of the plague in 1665, his whole household escaped the disease, owing, it was thought, to their inhaling the vapour of vinegar poured over a red-hot brick.

It was made a ground of complaint against Uvedale, in 1676, that he neglected the grammar-school, not, as has been stated, for his garden, but for his boarders; and he seems, like Goodenough at Ealing at a later date, to have found the means for cultivating his botanical tastes by keeping a fashionable school.† Among his pupils were Henry Hare, third Lord Coleraine, whose grandfather was an ardent florist; Francis, Earl of Huntingdon; Robert, Viscount Kilmorey, who died in 1717, whilst at the school; Sir Jeremy Sambroke; and, as appears from one of Uvedale's letters to Sloane (Sloane MS. 4064), William Sloane and another nephew of the great collector.

As to his pupils, however, the most interesting point is, perhaps, the tradition that to one of them we owe the introduction of the Cedar of Lebanon. The tradition is that he commissioned one of them who travelled to bring him a plant from Mount Lebanon, and that the tree now at Enfield, which the doctor undoubtedly planted, was brought, in response to this request, in a portmanteau. Unfortunately, no date is assignable to this circumstance, so that, though tradition assigns it to about the year 1670, we have no means of knowing whether the Enfield cedar was planted before 1683, the date when the Chelsea trees were planted. In 1788 this fine cedar was 45 feet 9 inches high, after losing 9 feet in a storm, and Loudon gives its height in 1835 as 64 feet, 8 inches. In 1794 it lost a large limb. In 1809, Lysons gives its girth at 3 feet 10 inches from the ground as 13 feet 1 inch; and in 1821 it is stated to have been 19 feet 9 inches at a foot from the ground, 15 feet 8 inches at 3 feet, and 14 feet at 6 feet. Detailed measurements are given in Loudon's *Gardener's Magazine* (vol. xi.), and in Robinson's *History of Enfield*, vol. i. pp. 116—118; and, besides the thumb-nail sketch of the tree in Loudon's *Arboretum Britannicum*, iv. 2404, Fig. 2269, it is figured in Strutt's *Sylva Britannica*, and Robinson's *History of Enfield*. Though it has suffered slightly from storm and snow during the last few years, this magnificent tree is not only still vigorous, but is undoubtedly steadily increasing in girth and in the spread of its branches. I saw some young cones on one branch of it, on October 24th, 1890, but they were not so superabundant as to show unhealthiness, and, though several of its limbs have to be propped up, the tree gives no

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* Ford, *History of Enfield*, p. 25. Robinson, p. 103—7.

† His opponents made the curious charge against him of having obtained from the Lord Chamberlain an appointment as an actor and comedian at the Theatre Royal, to protect him from the execution of a bond issued against him. Lysons, *Environs*, ii. 285.

suggestion of decay, and would seem quite capable of living for another century or two. The following measurements, given in Mr. Ford's *History of Enfield*, are interesting:— The tree was in girth

	In 1821.	In 1873.
At the ground	19 ft. 9 in.	25 ft. 3 in.
At 1½ ft. up	16 ft. 1 in.	19 ft. 7 in.
At 3 ft. up	15 ft. 8 in.	16 ft. 2 in.

Of Uvedale's garden we have a contemporary account, for in the twelfth volume of the *Archæologia* (1794), p. 188, is "a short account of several gardens near London," printed from a manuscript by J. Gibson, dated 26 Jan., 1691. Uvedale's is the sixteenth, and is thus spoken of:—

"Dr. Uvedale, of Enfield, is a great lover of plants, and having an extraordinary art in managing them, is become master of the greatest and choicest collection of exotic greens that is perhaps anywhere in this land. His greens take up six or seven houses or roomsteads. His orange trees and largest myrtles fill up his biggest house, and another house is filled with myrtles of a less size; and those more nice and curious plants that need closer keeping are in warmer rooms, and some of them stoved when he thinks fit. His flowers are choice, his stock numerous, and his culture of them very methodical and curious; but, to speak of the garden in the whole, it does not lie fine to please the eye, his delight and care lying more in the ordering particular plants than in the pleasing view and form of his garden."

Greenhouses and stoves were probably very rare in England before the close of the 17th century. Richardson, of North Bierley, and John Blackburne, of Warrington, were the first persons to possess them in the North of England. In the South, Lord Petre, at Thorndon, Essex; Peter Collinson, at Mill Hill; Samuel Reynardson, at Hillingdon; Charles Watts, at Chelsea;* and Uvedale, seem to have led the way.

The garden is still extensive, though all traces of the greenhouses, or indeed, with the exception of the cedar, of anything that can have been planted by Uvedale, have long since disappeared. *Hieracium murorum*, as pointed out in the *Flora of Middlesex*, still grows on the walls of the old palace as we know it to have done, from James Newton's MSS., in Uvedale's lifetime; and, as it is rather a northern form, it is highly probable that it may have been one of the many plants which he received from his constant correspondent, Dr. Richard Richardson, of North Bierley.

Among the Sloane MSS. (Sloane MS. 4064), are 17 letters from Uvedale, 10 addressed to Sloane himself, 1 to Petiver, and the remainder unaddressed but apparently mostly to Petiver, who seems to have been his ordinary medical adviser. The earliest letter is dated March 25th, 1691, the latest, February 2nd, $17\frac{16}{17}$; †

* See Letters from Sloane, in *Ray Correspondence* (ed. 1848), pp. 158—9, dated 1684.

† Petiver died in April, 1718.

but few of them contain anything of interest. In the 8th letter, apparently addressed to Petiver, sending him some drugs from Fort St. George, he writes :—

"I have added to accompany them a Bable [Bauble ?] wch. the Chinese Agyrtæ sell to our European mariners for the China Lamb, as ours make Mandrakes of Briony roots. I believe it a Fern root. The Mosse y^{t} grows upon it is a good Styptic and encreases upon it as long as there is any moisture wch. is continued a great while by oyling it once in 4 or 5 Months but I believe tis now effete I have putt upon the back of it a little of the Lambs wool as they nickname it." . . .

In a postscript is—

"I had a Letter from our Comon Friend Dr. Sherard last weeke w^{ch} came over Land dated Aug. 7th and wth it a Collection of Ranunculi he was then in health & seems to intimate that he shall not come for England yett having hired a Country house to reside in when his businesse permitts w^{ch} is accomodated wth a pretty large garden."

With these letters are two to Sloane from Thomas Uvedale, a kinsman, probably the brother, of the botanist, the translator of Philip de Comines. He writes from Hampton Wick, so that probably the plants in vol. 12 of the Sloane Herbarium endorsed as from "Dr. Uvedale, Hampton Court," are from him, and not from Robert Uvedale,

In 1682, Uvedale was made LL.D. of Cambridge, and that he was early recognised as an accomplished scholar is indicated by his being invited to contribute the "Life of Dion" to the translation of *Plutarch's Lives*, edited by Dryden, assisted by Somers and others, which appeared between 1683 and 1686. Uvedale's portion was published in 1684.

In *Richardson's Correspondence*, edited by Dawson Turner, 1835, only four of Uvedale's letters are preserved; but all these and fifty-six others are given in Nichols's *Literary Illustrations*, vol. iii. pp. 321—351, the earliest bearing date April 30th, 1695, and the latest Feb. 23rd, 1721. It is true that these letters contain comparatively little of any interest. Dr. Richardson seems once or twice every year to have sent him a present of heath-cocks and other game, together with Yorkshire plants such as *Cypripedium Calceolus*; and Uvedale, whilst complaining almost annually of his losses from the severity of the winter and the carelessness of his gardeners, sends relays of Cape aloes, auriculas, myrtles, tulips, anemones, and ranunculi, besides seeds. Owing to the irregularity of the Enfield post, he begs that all letters for him may be addressed to "The Bull," Bishopsgate Street. In May, 1699, he speaks of seventeen of his household "having had the small-pox within the compass of less than three months last past," eleven, including six of his own children, being down together. In 1700 he says that he had corresponded with Sutherland of Edinburgh "for some years": in August, 1702, he mentions a visit from "Dr. Sherard and young Brennius"; and in 1707, the receipt of a letter from Consul Sherard, then at Smyrna, and the present by Sloane of his work on Jamaica.

"The war," he writes, "hinders all foreign correspondence." Tulips, it seems, did not thrive at North Bierley, nor would *Calceolus* "stay long with" Uvedale at Enfield; in 1712 "an ignorant fellow pulled [it] up officiously for a dock, as he told [his master] he thought it."

Already, in 1710, Uvedale speaks of himself as growing old, mentioning that he has "a young Gardener, a son of mine (who is beneficed in Gloucestershire), to set up this year," and that his furniture has thinned" [his garden]. This was his son James.

In 1711, in which year, as we learn from Samuel Dale's herbarium, that botanist visited Enfield, Uvedale became seriously ill from a tumour, pronounced by a consultation of friends, both physicians and surgeons, to be "celes aquosus"; but in December, 1714, he writes:—

"I thank God I have no return of my former indisposition, but enjoy as much health as I can reasonably hope for at my years."

In August, 1718, he writes:—

"Dr. Sherard has been so kind as to give me his company and assistance in correcting my *Hortus siccus*, which is but meanly furnished, and most out of my own garden, which cannot be supposed to afford much, though it has been the grave of a great many plants which have grown there in half a century."

In a letter dated the following January, he says:—

"I am beholden to friends for the Plantæ imperfectæ of the first and second genus. I am very poor in Fuci, Algæ, Musci; some of the last sort Mr. Doody, when alive, bestowed upon me."

After this Richardson sent him some mosses. In December, 1721, when he was over seventy-nine, he writes that he has been for the first time attacked by gout, which he seems never to have got over. He says that he never in his life "was a good trencherman," that his garden has to be neglected, all the exercise he can take being "rumbling about four or five miles every day before dinner in [his] chariot," and his chief remaining pleasure consisting "in turning over [his] Hortus Siccus."

In 1696, Archbishop Tillotson, his neighbour at Enfield, who whatever his theological or political heterodoxy, seems generally to have patronised learning, had given him the rectory of Orpington, in Kent, to which St. Mary Cray was attached as a chapelry. Like many other rectors of his time, Uvedale appears to have been entirely non-resident. At all events it was at Enfield that he died, on August 17th, 1722, and in the parish church of St. Andrew there, within a stone's-throw of his house and school, that he was buried. On recently visiting the church I was unable to find any monument to the botanist, and his great-grandson states that the hatchment to his memory was removed to Langton Church, Lincolnshire. His wife, as we have seen, survived until 1740, and no doubt his growing plants and *hortus siccus* were sold either by, or for, her. Sherard writes to Richardson on October 13th, 1722 *:—"I shall go next week to see Mrs. Uvedale, in order to think of disposing of the plants.

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* *Richardson Correspondence*, p. 189.

Mr. Wasbourn [probably Uvedale's son-in-law] has planted the tulips, which will be sold in bloom; and, I believe, the best way with the stove-plants will be to sell them in pairs, or so many in a lott together." The "Catalogue of trees and shrubs" of the Society of Gardeners, 1730 (quoted by Loudon, *Arboretum*, p. 61), says of Uvedale that he "did, by his great correspondence abroad, collect a very valuable parcel of plants . . . and some . . . valuable trees were planted in the full ground, where they are now (1730) remaining, but the bulk of his collection was sold to Sir Robert Walpole, soon after the doctor's death." "Collection" being readily changed into "herbarium," this fact has probably given rise to the fiction that Uvedale's dried plants passed into Sir Robert's hands. That this was so is improbable, as their present position as vols. 302 to 315 of Sloane's Herbarium, almost the concluding volumes of that collection, indicates that they passed at once into his possession, "where," as Sherard says, "all things centre."* This collection, in fourteen thick volumes, having generally several specimens on a page, is as varied as it is extensive. It is arranged according to Ray's classification, and contains specimens of the earlier "genera,"—algæ, lichens, mosses, and ferns, though mainly made up of flowering plants. The plants are in admirable preservation, most of them being labelled in Uvedale's handwriting. They certainly bear witness to their owner's extensive correspondence, including, as they do, plants not only from Sherard, Richardson, Collinson, Petiver, Plukenet, Bobart, Rand, Dubois, Doody, Stonestreet, Sloane, William Vernon, and Sir G. Wheler, but also from Dr. Edward Buckley, in India, Tournefort, Magnol, Vaillant, Commeline, and Peter Hotton, of Leyden.

If we had no other knowledge of its collector, this herbarium alone would be sufficient to vindicate Uvedale from Dawson Turner's description of him as rather a florist than a botanist.† That he was admitted to be perhaps the most successful floriculturist of his time is true, but that does not prevent his having had a scientific knowledge, as well, of the subjects of his care.

Of his three sons, Robert became a Fellow of Trinity College, Cambridge, D.D., and, a year before his father's death, vicar of the College living of Enfield, which he held till his death in 1731; James became M.A., Fellow of Trinity, and Rector of Bishop's Cleeve, Gloucestershire; and Samuel, B.A., become Rector of Barking, Suffolk. Of the five daughters: Joanna, Margaret, Anne, Mary, and Elizabeth, the first married a Mr. Bullen; the second, the Rev. W. Washbourne. Robert, the Vicar of Enfield, in 1728, had a son Robert who became Fellow of Trinity, D.D., and Rector of Langton, Lincolnshire, and died in 1799, leaving a son Robert, M.A., Vicar of Fotherby, in the same county, the contributor to the *Gentleman's Magazine* and Hutchins' *History of Dorsetshire*. Samuel, the Rector of Barking, in 1729 had a son Samuel, born apparently in Warwickshire, who became a Lieutenant in the Navy in 1747, Captain in 1760, and Commander of the 'Ajax' in 1779; served

* *Richardson Correspondence*, p. 194. † Id., p. 15.

with Rodney and retired as Rear-admiral of the Blue in 1789. On January 18th, 1763, he married Miss Margaret Cook, of Edmonton, sixteen years his junior. He lived at Bosmere House, Suffolk; died December 13th, 1808; and is buried in Creting St. Mary Church, Suffolk. He had in his possession full-length portraits of his grandfather, the botanist, and his wife; but I have been as yet unable to trace them.

Petiver's genus, *Uvedalia*, a North American Composite, having became *Polymnia Uvedalia* L., Robert Brown founded the genus *Uvedalia* in *Scrophulariaceæ*, which in DeCandolle's *Prodromus* (vol. x., p. 368) is merged in *Mimulus*, one species being somewhat strangely named *M. Uvedaliæ;* but perhaps not only these species, but also the cedar that he planted, and the herbarium he collected, may for centuries to come keep alive the memory of Robert Uvedale.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from vol. xxviii. p. 376.)

Thomson, Spencer (fl. 1848–1883). M.D., St. Andrew's. Of Burton-on-Trent. 'Seed of Phaseolus,' Ann. & Mag. 1842, 542. 'Wanderings among Wild Flowers,' 1854; ed. 10, 1866. 'Wild Flowers worth notice,' 1858. 'Wayside Weeds,' 1864. Pritz. 315; Jacks. 612.

Thomson, Thomas (1773–1852): b. Crieff, Perthsh., 12th April, 1773; d. Kilmun, Argylesh., 2nd July, 1852. Father of the following. M.D., Edinburgh, 1799. Regius Prof. Chemistry, Glasgow, 1818. 'Chemistry of . . . Vegetables,' 1838. Jacks. 612; R. S. C. v. 970; Pharm. Journ. xii. (1852–3), 95; Gent. Mag. 1852, ii. 202; Allibone.

Thomson, Thomas (1817–1878): b. Glasgow, 4th Dec. 1817; d. London, 18th April, 1878. M.D., Glasgow, 1839. F.L.S., 1852. F.R.S. Surgeon, Bengal Army. Prof. Bot., Calcutta Medical Coll. Superintendent, Calcutta Bot. Gard., 1854. 'Flora Indica' (with J. D. Hooker), 1855. 'Western Himalayas and Tibet,' 1852. Collected in Cabul, Kashmir, &c. Plants at Kew, Brit. Mus., &c. Jacks. 612; R. S. C. v. 976; viii. 1080; Gard. Chron. 1878, i. 529; Journ. Bot. 1878, 160; 'Nature,' xviii. 15; Proc. Geogr. Soc. xxii. 309. Crayon portr. at Kew. *Hedyotis Thomsoni* Hook. f.

Thomson, William (fl. 1830). M.A. Of Manchester. 'Relation between Strata and Plants,' Mag. Nat. Hist. 1830, 410. 'Botanical notes on Llandudno,' Mem. Lit. Phil. Soc. Manchester, 2nd S. v. 165. R. S. C. 976.

Thomson, Rev. William Cooper (fl. 1820–1871). Nephew of George Thomson (2). Missionary in Calabar from 1849 to 1865. Afterwards practised Medicine in Liverpool. 'Ferns from Old

Calabar,' Trans. Bot. Soc. Ed. vi. 357 (1860). R. S. C. v. 976. 'Memoir of George Thomson,' 1881.

Thornhill, John (fl. 1803–1840). Of Gateshead. 'Fasciculus of Grasses,' 1806. 'Bot. Guide' (with Winch & Waugh), 1805. Contrib. to Eng. Bot. 1163, 2807, &c. Jacks. 257. *Phascum bryoides* var. *Thornhillii* Wils.

Thornton, Robert John (1758 ?–1837): b. circ. 1758; d. London, 21st Jan. 1837. M.B., Camb., 1793. M.D., St. Andrew's, 1805. L.R.C.P., 1812. Succeeded J. E. Smith as Lecturer on Bot. at Guy's Hospital. 'Temple of Flora,' 1799–1804. 'Practical Bot.,' 1808. 'Philosophy of Bot.,' 1809. 'Family Herbal,' 1810. Pritz. 316; Jacks. 612; R. S. C. v. 982; Munk, iii. 98; Gent. Mag. 1837, ii. 93. Engr. portr. by Ridley, after crayon by Russel, R.A., 1803, at Kew; one by Hill, after the same, in 'Family Herbal' one by B. Thomson, after Harlow, in 'Outline of Botany'; and one by Bartolozzi, after Russel, in 'Temple of Flora.' *Thorntonia* Reichb. = *Pavonia*.

Threlfall, William (1862–1888): b. Hollowfork, Preston, 1862; drowned in R. Dryala, Kurdestan, March, 1888; bur. Bagdad. B.A., Oxon, 1885. F.L.S., 1887. Was investigating Oriental Flora. Proc. Linn. Soc. 1887–8, 98.

Threlkeld, Rev. Caleb (1676–1728): b. Keiberg, Kirk Oswald, Cumberland, 1676; d. Dublin, 1728. M.A., Glasgow, 1698. M.D., Edinb., 1712. 'Synopsis stirp. Hibern.,' 1727. Had a private bot. gard., Loudon, Encycl. Gard. 282. Pult. ii. 196; Pritz. 316; Jacks. 612; Pref. to 'Synopsis'; Stewart & Corry, xiv.; Rose. *Threlkeldia* Br.

Thwaites, George Henry Kendrick (1811–1882): b. Bristol, 1811; d. Kandy, Ceylon, 11th Sept. 1882. Ph.D. F.L.S., 1854. F.R.S. C.M.G., 1878. Local Sec. Bot. Soc. Lond., 1839. Lectured at Bristol, 1846. Superintendent, Peradeniya Bot. Gard., 1849; Director, 1857–1880. Contrib. Bristol list to Top. Bot. and to 'Phytol.' from 1841. 'Enumeratio Pl. Zeylaniæ,' 1858–64. Described *Dasygloia amorpha* for Eng. Bot. (2941). Pritz. 318; Jacks. 612; R. S. C. v. 989; Proc. Linn. Soc. 1882–83, 43; Gard. Chron. 1874, 438, with portr.; 1882, ii. 505; 'Athenæum,' 1882, 500. Portr. Kew. *Thwaitesia* Montagne. *Kendrickia* Hook. f.

Tidyman, Philip (d. 1850): d. Aberdeen, 11th July, 1850. M.R.C.S., London. M.D., Göttingen, 1800. Of Charleston, U.S.A. '*Oryza sativa*,' Göttingen, 1800. Pritz. 318.

Tighe, William (fl. 1790–1811). M.P. 'Maritime Plants of Fethard, Co. Wexford,' 1802. 'The Plants,' a poem, 1808–11, with bot. notes. Jacks. 212.

Tilden, —. (fl. 1700). Hudson's Bay plants in Sherardian Herb., Oxford. Pursh. Flora Am. Sept. xviii.

Titford, William Jowit (fl. 1811): b. Jamaica. M.D. 'Hortus botanicus americanus,' 1811. Pritz. 319; Jacks. 354.

Tofield, —. (fl. 1778). Of Doncaster. Correspondent of Hudson. *Tofieldia* Hudson.

Tolmie, W. Fraser (d. 1886): d. Victoria, Brit. Columbia, 1886.

M.D. Pupil of Sir W. J. Hooker. To Fort Vancouver as medical officer, 1832. Canadian Geol. Survey. Contrib. to 'Fl. Boreali-Americana.' Comp. Bot. Mag. ii. 159; Amer. Journ. Sci. cxxxiii. 244. *Tolmiea* Hook. = *Cladothamnus Tolmiea* Tur. & Gr.

Tomlinson, George (1696–1760): b. 8th Aug. 1696; d. Hathern, Leicestersh., 10th Feb. 1760. Relative of Pulteney. 'Miscellanies,' MS.? Contributed to Gent. Mag. Had herbarium of 1000 species. Left paintings and MS. descriptions. Pulteney in Nichols' 'Hist. Leicestersh.' iii. 847.

Tonge, Rev. Ezerel (1621–1680): b. Tockill, Yorks, 11th Nov. 1621; d. Tockill, 18th Dec. 1680. D.D. Communications relating to vegetation in Phil. Trans. iii.–v.

Towers, George John (fl. 1834–1847). 'Potato-disease,' Journ. Hort. Soc. ii. 1847, 31; iii. 1848, 22. 'Absorption of coloured infusions by roots,' Trans. Hort. Soc. ii. 41. R. S. C. vi. 16.

Townley, John (fl. 1836–1847). Of Preston. Agricultural writer. 'Diseases of Potato,' 1847. Jacks. 102.

Townshend, Rev. Joseph (d. 1816): d. Pewsey, Wilts, 9th Nov. 1816. M.A., Camb., 1765. Rector of Pewsey. Geologist. 'Food of Plants.' Nicholson, Journ. Nat. Phil. xxiii. 5 (1809); R. S. C. vi. 17; Rose; Allibone.

Townson, Robert (fl. 1792–1799). LL.D. F.R.S., Ed. M.D., Göttingen, 1795. Travelled in Hungary, 1793. 'Perceptivity of Plants,' Trans. Linn. Soc. ii. 267. Tracts in Nat. History and Physiology, 1799. R. S. C. vi. 17; Allibone.

Tozer, Rev. John S. (d. 1836). Drowned near Shrewsbury, March, 1836. Curate of St. Petrock, Exeter. Contributed to Hooker's Brit. Flora and to Fl. Devoniensis. Discovered *Erica ciliaris*. Mag. Zool. Bot. i. 1837, 112; E. Bot. 2618, 2628; Gent. Mag. 1836, 438. *Bryum Tozeri* Grev.

Tradescant, John (d. 1638): b. in Holland; d. Lambeth, Aug. 1638; bur. Lambeth. Gardener to Charles I. Went to Algiers 1620, and travelled through Europe, Egypt, &c. 'Museum Tradescantianum,' 1656, with portr. by Hollar. Rees; Ger. em.; Parkinson; Phil. Trans. xlvi., with portr.; Loudon, 'Arboretum,' 40, 49; Michaud; Lysons' Environs of London, i. 240. Portr. in Nichols' 'Illustr. to Granger.' *Tradescantia*.

Tradescant, John (1608–1662): b. Meopham, Kent?, 1608; d. Lambeth, 22nd April, 1662; bur. Lambeth. Gardener to Charles II. Son of preceding. Introduced *Tradescantia*, *Liriodendron*, &c. Pritz. 321; Evelyn, 'Sylva,' ed. Hunter, i. 207; Loudon, 'Arboretum,' 49–50; Cott. Gard. iv. 269; viii. 3; Michaud; Felton, 92. Portr. by Hollar in Phil. Trans. xlvi. and lxiii. 'Museum Tradescantianum' and Nichols' 'Illustr. to Granger.' Portr. at Kew and at Ashmolean Museum, Oxford.

Traill, Catherine Parr *née* **Strickland** (1801?–1889?): b. Suffolk?, England, 1801?; d. in Canada, 1889? Sister of Agnes Strickland. Of Lakefield, Ontario. To Canada, 1832?. 'Canadian Wild Flowers,' 1869. 'Studies of Plant-life in Canada,' 1884. Jacks. 366. Portr. prefixed to 'Studies.'

Traill, James (fl. 1827). Gardener at Chiswick. A.L.S., 1827. 'Hoya,' Trans. Hort. Soc. vii. 16. R. S. C. vi. 18.

Traill, William (d. 1886) : b. Kirkwall; d. St. Andrews, 10th Dec. 1886; bur. St. Andrews. Conchologist. M.D., Edin., 1841. F. B. S. Ed., 1841. 'Submarine Forests in Orkney,' Journ. Bot. 1867, 174. R. S. C. vi. 21; viii. 1107; Trans. B. S. Ed. xvii. 17.

Travis, William (fl. 1795–1836). Of Scarborough. A.L.S., 1795. Contrib. to E. Bot. 267, 285, 310, 319, 430, 1202. Jacks. 259.

(To be continued.)

SHORT NOTES.

Ranunculus lacerus Bell.—This last summer, Mons. Émile Burnat, of Vevey, Switzerland, who has been working at the Flora of the Maritime Alps for about twenty years, and who has already published the *Hieracia* and *Rosæ*, jokingly said to me, when I told him that I was going to the Val Pesio, near Cuneo, for a few months:—"You must look for *Ranunculus lacerus* Bell., a supposed hybrid between *R. pyrenæus* L. and *R. aconitifolius* L." I did not know anything about this plant, but I had not been settled at the village inn of S. Bartolomeo more than ten days, when on walking up M. Masceron, after passing masses of *R. aconitifolius*, and arriving at the slopes where *R. pyrenæus* began at about 4500 ft., I saw two plants of a *Ranunculus* which I had never found before, and which I at once imagined might be the rarity in question. A week later, in the last days of June, at about the same elevation, in the Val Arpi, at the head of Val Pesio, near the same two common white Ranunculi, I found five or six other specimens, and when I gave these to M. Burnat he at once pronounced them to be the true *R. lacerus* of Bellardi. At the end of July I returned to the latter locality, and found, after very long search, one plant in fruit. The carpels of this, as well as the pollen of the first-gathered flowers, have both been examined by M. Burnat and M. Briquet at Geneva, and they are convinced that the plant is a hybrid. Bellardi (*App. ad flor. pedem. Act. Acad. Turin.* 1790–91, p. 233) published a figure of his plant, which exactly agrees with mine; one of the specimens in the Turin Herbarium gives the locality Mala Valanca, which not improbably is the valley now called Val Valanca dei Frati, a valley leading out of V. Pesio, between Monte Masceron and V. Arpi. The other specimens Bellardi received from a botanist named Viale, of Limone, who gathered them on the mountains above that town, that is to say, at a short distance from V. Pesio. There are also examples, somewhat different in form, in the Herbarium DeCandolle, grown, I believe, in the Botanic Garden of Grenoble; but it seems that since Bellardi's date the plant, though constantly searched for, has not been found wild, though forms of *R. pyrenæus* with laciniated leaves have been taken for it. Villars (*Fl. Dauph.*) has a "*R. pyrenæus* var. foliis plantagineis laceris furcatisve." Haller, Suter, and Reichenbach also

speak of varieties. At St. Bernard, where the two Ranunculi grow together by thousands, no hybrid has been observed, though some large forms of *R. pyrenæus* with laciniated leaves have been found there. M. Buser, Conservator of the Herbarium DC., says in Gremli's *Beitr. Fl. Schweiz.* fasc. 4, p. 7, that mere varieties of *R. pyrenæus* have been mistaken for Bellardi's plant, and lastly, M. Freyn, in No. 2, *Botanischer Centralblatt*, p. 34, 1890, has written a long article to prove that the hybrid does not exist. None of the varieties mentioned by these authors appear to agree with the figure given by Bellardi. M. Burnat has written a paper on the subject, which is now in the printer's hands. It would be interesting to know why this plant of Bellardi, now re-discovered after 100 years, should have been found only in three or four sites within a few miles of each other, seeing that its parents are so widely distributed, and so commonly found together.—C. Bicknell.

New Stations of Irish Plants. — Under this title Mr. Cecil Butler (*Journ. Bot.* 1890, 362) records *Atriplex arenaria* Woods. from "sea-shore near Newcastle, Co. Down." This plant was found there by John Templeton in 1805, as recorded in Stewart and Corry's *Flora of the North-east of Ireland*, and Newcastle is still a well-known station for it among local botanists.—R. Lloyd Praeger.

NOTICES OF BOOKS.

Materials for a Flora of the Malayan Peninsula. No. 1 [1889]; No. 2 [1890]. By George King, F.R.S., Superintendent of the Royal Botanic Garden, Calcutta. [Reprinted from the *Journ. Asiat. Soc.*, Bengal, v. 58, part 2, n. 4; and v. 59, part 2, n. 2].

After the completion (practically) of the local Floras of England, France, Germany, &c., we have lately seen a Flora of Europe compiled (in the main out of these local Floras) by Nyman. Different circumstances have necessitated a reversed procedure in the case of the Flora of British India. This Flora, which (imperfectly known) may run to 17,000 species, is larger (in number of species) than the Flora of Europe: but it is, both as regards economic value and difficulty of working up, very much larger, owing to the larger percentage of trees, large shrubs and woody climbers in it.

Sir J. D. Hooker, in 1872, commenced his *Flora of British India* with the modest statement that he put it forward only as a handbook to what was already known, and a pioneer to more complete works. It is true that there were preceding local Floras, such as Thwaites' Enum. Pl. Ceylon, Strachey's Catal. Pl. Kumaon, Dalzell & Gibson's Bombay Fl., Wight & Arnott's Prodr. Fl. Peninsula (a fragment); but these were lists without descriptions (except of species described for the first time), or otherwise (as to synonymy, geographical distribution, &c.), so imperfect, that the *Flora of British India* has not been compiled to any considerable

extent out of preceding authors (like Nyman's European work), but has had to be worked up from the material at Kew, the British Museum, and the Linnean Society. The *Flora of British India* has now been eighteen years in publication; and, as in the case of all works so long in hand, the scale has grown enormously. In some of the Orders in the earlier volumes, hardly any material beyond the Indian was compared; the specific description of an important shrub or tree is compressed into two lines, the synonymy, &c., is curt. From this scale there has been a gradual evolution, till in the Orders lately published, especially those done by Sir J. D. Hooker himself since he has been less distracted by official cares, the work amounts to a Monograph of the Indian species after a Review of the Order. This development of scale has been partly brought about by the continual additional supplies of material; especially from the Malay Peninsula. The Orders Laurineæ, Euphorbiaceæ, Cupuliferæ, &c., have been largely elaborated from material received from Dr. King long since the earlier volumes of the *Flora of British India* were published.

Sir J. D. Hooker's great undertaking has thus become a monumental work,—on which all the future botany of British India will be grounded; but its very magnitude limits its immediate usefulness. Few persons, except professional botanists, can really use a book describing 17,000 species; an English resident in Tenasserim or Travancore does not want a book encumbered with descriptions of thousands of plants that grow in the dry north-western area, or in the temperate Himalaya. It was always intended that, as one sphere of its usefulness, the *Flora of British India* should be the mine out of which local Floras for the provinces of India should be dug. Dr. Trimen has been already engaged for some time on the preparation of a Flora of Ceylon; and Dr. King has now commenced the publication of a *Flora of the Malay Peninsula*, before the *Flora of British India* is completed. That completion appears now within measurable distance; and, as soon as that work is completed, mere compilations out of it of the "Flora of Bengal" (not including Himalaya), the Flora of the Punjab with Rajpootana" (not including the Himalaya), may be worth preparing by mere book-making for the use of the Government secretariat, civil officers, and planters. The object of accomplished botanists, however, like Trimen and King, is not merely to abstract but to supplement the *Flora of British India;* to add to the dry bones of a species, often only defined morphologically in an English herbarium, the knowledge obtained by cultivating it or by residing among it; and to describe further in their proper places the new species that have been discovered since the date that the genus was treated of in the *Flora of British India*. Any province will be fortunate that gets its local Flora prepared by a skilled botanist, instead of by a talented assistant-secretary.

The first question will be, What constitutes a convenient province for a local Flora? It must not be too large; it is to be feared that a local Flora of Ceylon will make a book cumbrous for general use. In their Introduction to the *Flora of British India*, Hooker,

f., and T. Thomson have divided British India into botanical provinces. In this scheme, the hand of Dr. Thomson is too evident; he has divided the North-west Himalaya, where the flora is botanically one, into a large number of very small provinces, while parts of India with which Dr. Thomson was not so well personally acquainted are divided very little. The English portion of the Malay Peninsula is separated from the Siamese by the dividing range which runs through its whole length; and the English (western) portion is divided (by Hooker, f., and T. Thomson) into the two provinces of Tenasserim and Malayan Peninsula. These two provinces were very imperfectly known (geographically and botanically) at the date of the earlier parts of the *Flora of British India*. We will confine ourselves to "The Malayan Peninsula" (as above defined), which extends from Singapore about 700 miles north to the Tenasserim boundary. For this area the only special previous botanic writings Hooker, f., and T. Thomson refer to are the excellent but short papers of Jack. For material they had the collections (all made during short calls on a sea voyage) at Penang, Malacca, and Singapore; also (even when the Anonaceæ were published in the *Flora of British India*), they had the splendid collections (with notes) made by Dr. Maingay, who was resident at Malacca. Also, various collectors who landed at Malacca made the excursion thence to Mt. Ophir (alt. 5000 feet), which excursion supplies an extraordinary number of peculiar and interesting species. A glance at the map will show that these collections were far from botanically exhausting the province. It is clear that the Malayan Peninsula (as we are narrowing it down) must contain a similar vegetable wealth to Sumatra or Java (cutting off the upper 4000 feet of those islands). The last twenty years have greatly extended our sphere of knowledge in the Malayan Peninsula: owing to the large discoveries in tin, the state of Perak has been invaded by English enterprise, and has been brought closely under English political control.

From the above and further considerations, Dr. King was led to pay particular attention to the Malay Peninsula as a field of research whence to enrich the Calcutta Herbarium. He sent collectors to Perak especially, and to neighbouring states that were "opened up" for European visitors. The results surpassed his expectations. His collectors visited the old collecting ground in Penang and found numerous fine new species there. This is not surprising; Mr. Ridley has found, in a very short residence at Singapore, species new to British India. Dr. King then visited the province himself. Father Scortechini, a most enthusiastic collector, paid a long visit to Perak, and his collections came to the Calcutta Museum.

In these various ways a splendid material, from the "Malayan Peninsula" was accumulated, in the course of some years, by Dr. King. The plants were seen to be largely arborescent, many new species, many others elucidating old imperfectly-known species. Dr. King, though able as well as any man to gauge the magnitude of the undertaking, was thus led, almost driven, to undertake the

Flora of the Malayan Peninsula. The first two parts of this, carrying the work from Ranunculaceæ to Ternstroemiaceæ (in Benth. & Hook. f. order, omitting for the present the Anonaceæ), form the subject of this notice. Dr. King modestly says it is unlikely that he will be able to complete the work under several years; but the two parts already issued, containing descriptions of 244 species, quite suffice to enable us to estimate the interest of the plants in this fine region.

It would appear that Dr. King includes in his area the English portion of the province called by Hooker, f. et T. Thomson "The Malayan Peninsula"; for he does not cite any localities from the Siam side, while he places "Tenasserim" among his Geographic Distribution area. But he does include the Nicobars and the Andamans, the latter of which (at least) belongs rather to Tenasserim.

For this area Dr. King has collections from Singapore and Malacca, from Perak and one or two small neighbouring states (Seelangor, Trang), from Penang, the Nicobars and Andamans. But for the northern half of his mainland area he appears to have nothing. The few plants that are known from Junk Seylan are of much interest. Grand as are the collections got together by Dr. King, they can by no means represent completely the Flora of his province.

The two parts of the *Flora of the Malay Peninsula* now published contain descriptions of 244 species,—Ranunculaceæ to Ternstroemiaceæ [omitting Anonaceæ]; of these, 116 were in Sir J. D. Hooker's *Flora of British India;* 100 are altogether new to science; 28 are new to the Malay Peninsula, having been mostly before known only in the Malay Islands. But of the 144 species before described, many were before known very imperfectly, and of a large percentage of these Dr. King has made additions to our knowledge; the descriptions are generally much fuller, and in many cases Dr. King has been able to add a description of fruit before unknown.

The 100 new species, now first described by Dr. King, are, with two or three exceptions only, arborescent, *i.e.*, trees, shrubs, or woody climbers. They are not new species made by the separation of one valueless weed from another by trivial characters. It is in this respect that the Malay Peninsula Flora is of such high practical interest; there is hardly one of these new species which may not, quite possibly, prove of economic value.

Dr. King might have arranged his work on the plan of Thwaites' Enum. Plants Ceylon, *i. e.*, he might have enumerated only (without descriptions) the species in the *Flora of British India*, and intercalated with descriptions his own new species. This would have obviated a certain amount of repetition in the characters of the Orders and the well-known Genera. But the number of new species is so great, and the number of old species given materially improved descriptions is so large, that the saving in space by this plan would not have exceeded about 20 per cent. This saving would have rendered the book handy to the professed botanist in a library, but would have made it absolutely useless as

a local Flora. Dr. King has probably chosen the better plan, *viz.*, to make the work as complete as possible as a local Flora; the objection made to this course is that it must rather increase the labour of preparation, *i. e.*, diminish the rate at which the work can be produced.

It is impossible to give here a full analysis of Dr. King's new species; 11 (to 4 old) *Alsodeia*, 11 (to 10 old), *Xanthophyllum*, 16 (to 20 old), *Garcinia*. In lieu of our 1 old *Hydnocarpus*, he gives us 5 *Hydnocarpus*, 4 *Taraktogenos*, 7 *Ryparosa* (all trees). At present Dr. King is working behind Pierre's magnificently illustrated *Forest Flora of Cochin China*, and is able to avail himself thereof; but in his next number he will probably overtake Mons. Pierre, and lose his assistance.

It only remains to add our best wishes that Dr. King may complete his Flora—and sooner than he expects. The work is not so large as it appears from these two parts, because for the Apetals and Monocots the Malay new material of Dr. King has been worked up by Sir J. D. Hooker, in the *Flora of British India*. When, therefore, the present *Flora of the Malay Peninsula* has been pushed to the end of the Monopetals, the remainder can (or very nearly can) be done by "extracting" from Sir Joseph Hooker's work.

C. B. C.

The Pinks of Central Europe. By F. N. Williams, F.L.S. 8vo, 66 pp., 2 plates. Published by the Author, 181, High Street, Brentford. Price 4*s.* 6*d.*

We think that it would have been more convenient and useful to botanists if Mr. Williams had monographed the species of *Dianthus* in systematic order, taking, say, the *Armeriastra* in one paper, the *Caryophyllastra* with dentate petals in a second, and the *Caryophyllastra* with fimbriate petals in a third, instead of dividing them out geographically. First he gave us a classified catalogue of species. Last year he described the Pinks of Western Europe. In this present paper he deals with those of Central Europe, not describing afresh the West European species; and still there remain those of the Mediterranean region, Eastern Europe, and the comparatively few extra European species to be dealt with before the subject is exhausted. In Central Europe there are 76 species out of a total of 230. His descriptions are clear and concise, and he has taken great pains to work out the varieties and geographical range of the species. The Austrian botanists make species and varieties very freely, and in species-limitation he has followed the plan of Schur, Schott, and Boissier, in preference to that of Koch, Hooker, and Asa Gray. *Dianthus* is a very difficult genus, and it is a great boon to have all the species that have been described brought together and treated on one uniform plan; but of the 76 species he assigns 59 to Austria, 24 to Roumania, 22 to Servia, 17 to Northern Italy, 15 to Switzerland, 11 to Germany, 7 to Poland, 5 to Denmark, and 4 to the south of Sweden, and these are the countries which the present paper covers. He includes the few species of *Tunica* and *Velezia* which grow in the same area,

but he still keeps in *Dianthus*, *D. prolifer* and its neighbours, which in Bentham and Hooker's 'Genera Plantarum' are removed to *Tunica*. The book is dedicated to Cardinal Haynald. We may also draw the attention of our readers to Mr. Williams' address on Garden Pinks, delivered at the Carnation Conference at Chiswick last July, which has just been printed in the Journal of the Royal Horticultural Society. J. G. B.

NEW BOOKS.

J. E. Bagnall.—'The Flora of Warwickshire.' 8vo, pp. xxxiv, 519, viii. Map. Gurney & Jackson, "1891." £1.

H. Baillon.—'Les Herborisations Parisienne.' 12mo, pp. 482. 445 figures. Paris, Doin. 6 fr.

G. Ritter Beck.—'Flora von Nieder-Oesterreich.' Erste Hälfte. 8vo, pp. vi. 432. 77 cuts. Wien, Gerold, 1890.

W. Behrens.—'Leitfaden der botanischen Mikroskopie.' 8vo, pp. viii. 208. 150 cuts. Braunschweig, Bruhn, 1890.

L. Boyer.—'Les Champignons comestibles et vénéneux de la France.' 8vo. pp. viii. 157. 50 coloured plates. Paris, Baillière, "1891."

E. Drake del Castillo.—'Remarques sur la Flore de la Polynésie.' 4to, pp. 52, 7 tables. Paris, Masson, 1890.

M. Colmeiro.—'Resumen de los datos estadisticos concernientes â la vegetación espontánea de la Peninsula Hispano-lusitana é Islas Baleares.' 8vo, pp. 31. Madrid, 1890.

O. Drude.—'Handbuch der Pflanzengeographie.' 8vo, pp. xvi. 582. 3 maps. Stuttgart, Engelhorn, 1890.

R. Hartig.—'Lehrbuch der Anatomie und Physiologie der Pflanzen.' 8vo, pp. viii. 308. 103 cuts. Berlin, Springer, "1891."

J. R. Jackson.—'Commercial Botany of the Nineteenth Century.' 8vo, pp. 168. Cassell & Co., 1890. 3s. 6d.

E. J. Lowe.—'British Ferns and where found.' 8vo, pp. 167. 46 cuts. Swan Sonnenschein, "1891." 1s.

H. Molisch.—'Grundriss einer Histochemie der pflanzlichen Genussmittel.' 8vo, pp. 66. 15 cuts. Jena, Fischer. "1891."

W. Nylander. — 'Lichenes Japonicæ.' 8vo, pp. 122. Paris, Schmidt, 1890.

O. Penzig.—'Pflanzen-teratologie.' Erster Band, Dicotyledones Polypetalæ. 8vo, pp. xx. 540. Genua, Ciminago, 1890.

K. Richter.—'Plantæ Europeæ Enumeratio systematica et synonimica plantarum phanerogamicarum in Europa sponte crescentium vele mere introductum.' 8vo, vol. i. pp. 378 (Gymnospermæ & Monocotyledones). Leipzig, Engelmann, 1890.

E. Sagorski & G. Schneider. — 'Flora der Central Karpathen. 1 Hälfte. Flora der Hohen Tatra nach Standörten.' 8vo, pp. xvi. 210. 2 Hälfte. 'Systematische Uebersicht und Beschreibung der in den Centralkarpathen vorkommenden Phanerogamen und Gefäss-Cryptogamen.' pp. 590, lvi, tt. 2. Leipzig, Kummer, "1891."

C. S. Sargent.—'The Silva of North America.' Vol. i. Magnoliaceæ—Ilicineæ. Fol., pp. 119, tt. 50. Boston, Houghton, Mifflin & Co., "1891." £5 5s.

K. Schumann.—'Neue Untersuchungen über des Blüthenanschluss.' 8vo, pp. viii. 519. 10 plates. Leipzig, Engelmann.

G. Terrenzi.—'Contribuzione allo studio della Flora Narnese.' 8vo, pp. 64. Terni, 1890.

K. von Tubeuf.—'Samen, Fruchte und Keimlinge der in Deutschland heimischen oder eingeführten forstlichen Culturpflanzen.' 8vo, pp. v. 154. Berlin, Springer, "1891."

ARTICLES IN JOURNALS.

***Annales des** Sciences Naturelles* (xi. 4–6, Nov.).—Lamoinette, 'Sur l'origine morphologique du liber interne' (3 plates).—H. Duliot, 'Sur la croissance terminale de la tige des Phanerogames' (7 plates). (xii. 1–3, Dec.).—M. Thouvenin, 'Sur la structure des Saxifragacées' (22 plates).—A. G. Garcin, 'Sur l'histogénèse des **péricarpes charnus.'**

Bot. Centralblatt (Nos. 44, 45).—K. Mischke, Uber das Dickenwachsthum der Coniferen.'—(No. 44). W. Migula, 'Beiträge zur Kenntniss des *Gonium pectorale*.'—(No. 46). T. von Heldreich, 'Ueber *Campanula anchusiflora* und *C. tomentosa* der griechischen Flora.'—No. 47. C. A. M. Lindeman, 'Einige Notizen über *Viscum album*.'—C. Ochsenius, 'Briefliche Mittheilung von R. A. Philippi in Santiago de Chile.'—(No. 48). R. Keller, 'Beiträge zur schweizerischen Phanerogamenflora: ii. Die Coniferenmistel.'—(No. 49). P. Kunth, 'Die Bestäubungseinrichtung von *Crambe maritima*.'—R. Hesse, 'Zur Entwickelungsgeschichte der *Hypogaeen*' (tt. 2).—(No. 50). F. G. Kohl, 'Zur physiologischen Bedeutung des oxalsauren Kalkes in der Pflanze.'—(Nos. 51, 52). J. Röll, 'Vorlaufige Mittheilungen über die von mir im Jahre 1888 in Nord-Amerika gesammelten neuen Arten und Varietäten der Laubmoose.'—A. N. Lundström, 'Ueber regenauffangende Pflanzen.'

Bot. Gazette (Nov.).—F. Stephani, 'Hepaticæ novæ in insulis Bourbon, Maurice, et Madagascar lectæ' (3 plates).—A. C. Eycleshymer, 'Colloidin imbedding in plant histology.'—M. B. Thomas, 'The Collodion method in Botany.'—F. W. Anderson, 'Biography of J. B. Ellis.'—E. J. Hill, 'Notes on Flora of Lake Superior Region.'

Bulletin Torrey Bot. Club (Nov.).—J. Macoun, 'Contributions to Canadian Bryology.'—N. L. Britton, 'Rusby's American Plants' (*Passiflora Rusbyi*, *P. nephrodes*, *Cyclanthera* (?) *Rusbyi*, *Echinocystis macrocarpus*, spp. nn.).

Bull. Soc. Bot. France (xxxvii. Comptes rendus 4, Nov. 1).—G. Rouy, 'Plantes nouvelles pour la Flore Européenne.' (*Calycotome hispanica*, *Galium dacicum*, *Senecio Coineyi*, *Cirsium Grecescui*, *Thymus Antoninæ*, *Stachys arenariæformis*, *Ornithogalum subcucullatum*, spp. nn.).—H. Devaux, 'Température des tubercules en ger-

mination.'—E. G. Camus & L. Leguè, 'Les *Primula* des environs de Paris.'—Id. 'Plantes de Neuvy-sur-Baraugeon (Cher).'—A. Lottietier, 'Sur la production des piquants.'—C. Degagny, 'Origine nucléare du protoplasma.'—W. Russell, 'Sur la vrille des Passiflores.'—G. Chastaignt, 'Rosiers de l'Indre et d'Indre-et-Loire.' M. Gandoger, 'Voyage botanique au Mont Cenis.'—P. Vuillemin, 'Sur la structure des feuilles de *Lotus*.'—J. Daveau, 'Plantes critiques de la Flore Portugaise.'—(Session extraordinaire à la Rochelle:) (Dec. 10). E. Boncet, 'Voyage de Morison et Langier à la Rochelle en 1657.'—G. Rouy, 'Sur la Synonymie de quelques plantes occidentales,' (*Bupleurum opacum* Lange, ap. Willk. et Lange, Prodr. iii. 71 = *B. aristatum* Gr. & Godr. et auct mult. non Bartl.). F. Hy, 'Characèes récoltées à la Session.'—Id. 'Sur les *Equisetum* de la Section *Hippochaete*.'—E. Bureau, 'Notice biographique sur le Dr. E. Cosson (portrait).—E. Malinvaud, 'Questions de nomenclature: *Ranunculus chærophyllos* and *Globularia vulgaris*.'

Gardeners' Chronicle (Nov. 1).—*Aristolochia longecaudata* Masters (fig, 98). *Sobralia Sanderæ* Rolfe, sp. n.—(Nov. 8). *Gladiolus Kirkii* Baker, *Masdevallia O'Brieniana* Rolfe, spp. nn.—(Nov. 15). *Oncidium Leopoldianum* Rolfe, sp. n., *Pinnspondbosa* (figs. 110–111, 114, 115). Wild Chinese Primula and Chrysanthemum (figs. 112, 113).—(Nov. 29). *Decaschistia ficifolia* (fig. 122).—(Dec. 6). W. G. Smith, *Glæosporium læticolor* (fig. 125). — (Dec. 13). *Cattleya Rex* O'Brien, *Crassula recurva* N. E. Br., spp. nn. *Abies Fraseri* (fig. 132).—C. T. Druery, 'Abnormal growth of *Adiantum* (fig. 137).—(Dec. 27). *Rodiguezia Fuerstenbergii* Krauzlin, sp. n. *Abies concolor* (figs. 147–151).

Journal de Botanique (Oct. 16).—M. Gomont, 'Classification des Nostocacées homocystées.' — P. A. Karsten & P. Hariot, 'Fungilli imperfecti novi.' — L. Morot, 'Dobinea & Podoon.' — (Nov. 1). P. van Tieghem, 'Structure de la tige des Prêles.' — H. Feer, 'Recherches sur quelques Campanules.'—(Nov. 16). L. Guignard, 'Sur la localisation des principes actifs des Crucifères.' — C. DeCandolle, 'Les Piperacées de l'Ecuador, de la Nouvelle-Grenade et du Pérou. — H. Leconte, 'Sur le rôle du liber.' — (Dec. 1). P. van Tieghem, 'Structure de la tige des Ophioglossés.' — H. Christ, '*Cyathea Bonii*, sp. n.'— E. Malinvaud, '*Globularia vulgaris* L. & *G. Willkommii* Nyman.'

Journal of Linnean Society (Nos. 189–91: Nov. 5).—H. Collett & W. B. Hemsley, 'On a collection of Plants from Upper Burma and the Shan States' (22 plates: *Neocollettia* Hemsl., gen. nov. (Leguminosæ Hedysareæ)). — (Nos. 185–6: Nov. 13). F. B. White, 'Revision of British Willows' (3 plates). — (No. 192: Dec. 15). G. Henslow, 'Vascular Systems of Floral Organs and their importance in interpretation of Morphology of Flowers' (10 plates). —D. Morris, 'Production of Seed in Sugar-cane' (1 plate).*

* In connection with this paper, the observations of Dr. Fressanges, translated in this Journal for Oct. 1890, pp. 303—5, are of interest: they are not alluded to by Mr. Morris.

Journal of R. Horticultural Soc. (Nov.). — R. J. Lynch, 'New Classification of *Pæonia* (*P. Bakeri*, *P. Barrii*, spp. nn.). — F. N. Williams, 'The Carnation from a botanical point of view.' — F. O. Bower, 'Which are the oldest Ferns?' — E. J. Lowe, 'Hybrid Ferns.' — C. T. Druery, 'Plumose British Ferns.' — W. B. Plowright, 'Heterœcismal Fungi' (*Puccinia Festucæ*, *P. Agrostidis*, spp. nn.).

Oesterr. Bot. Zeitschrift. (Nov.). — R. v. Wettstein, 'Ueber die Section *Laburnum* der Gattung *Cytisus*' (1 plate). — J. Freyn, 'Plantæ novæ Orientales' (*Silene tenuicaulis*, *Haplophyllum Bornmülleri*, *Astragalus eriocalyx*, *A. Chamæphaca*, *A. Bornmülleri*, (spp. nn.).—E. v. Halácsy, 'Beiträge zur Flora der Balkanhalbinsel' *Hypericum orbiculare*, *Celsia roripifolia*, spp. nn.). — P. Tunbert, 'Die Gattung *Phyllostylon* Capan, und ihre Beziehungen zu *Samaroceltis* Poiss.' — A. Durrnberger, '*Cirsium Stoderianum*.' — H. Zahn, '*Carex Kneuckeriana*.' — (Dec.). E. v. Halâcsy, 'Neue Brombeerformen aus Oesterreich' (*Rubus Kelleri*, *R. styriacus*, *R. Gremblichii*, *R. macrocalyx*, *R. Richteri*, spp. nn.). — P. Magnus, 'Ein neues Unkrant auf den Weinbergen bei Meran' (*Galinsoga parviflora*).— J. Freyn, 'Plantæ novæ Orientales' (*Astragalus Uhlwormianum*, *A. Tempskyanus*, *A. Kongeanus*, *Onobrychis xanthina*, *O. stenostachya*, spp. nn.).—M. Kronfeld, 'Die Maria-Theresia-Palme.'

BOOK-NOTES, NEWS, &c.

M. Durand has conferred a benefit upon the readers of the *Bulletin de la Société Royale de Botanique de Belgique* by the compilation of a general index to the first twenty-five volumes (1862–87) of that work. The index is divided into three parts:—"1. Table par order des matières; 2. Table des noms d'auteurs; 3. Table générale des genres et des espèces": and forms an 8vo volume of 358 pages. We must express our own preference for a single index, like that prepared by Mr. B. D. Jackson for the Linnean Society's Journal.

Messrs. Cassell have added to their series of reading-books an attractively written volume, entitled *Object Lessons from Nature*, by Prof. L. C. Miall. The author rightly lays stress on the desirability of having the objects referred to "seen and handled" by the pupils; but the numerous and excellent illustrations go far to supply the defect where the objects cannot be obtained.

We are glad to see that Reichenbach's *Xenia Orchidacea* is to be carried on by Dr. F. Kränzlin. The first part of the continuation contains a new species of *Angræcum*—*A. Reichenbachianum* Kränzl. The plates are from Reichenbach's drawings, with the exception of *A. Rohlfsianum*, for which Dr. Kränzlin is responsible.

The first part of Miss Woolward's monograph of *Masdevallia* has been issued. We hope to notice this sumptuous and expensive work in our next issue.

The fourth part of Mr. F. J. Hanbury's beautifully illustrated *Monograph of the British Hieracia* contains plates of *H. calenduliflorum*, *H. gracilentum*, *H. globosum*, and *H. nigrescens*.

We have received from the author, M. E. Drake del Castillo, his *Remarques sur la Flore de la Polynésie*—a quarto memoir which has been "crowned" by the Academy of Sciences of Paris. The relations of this to the neighbouring Floras is dealt with, and there are seven useful tables showing the distribution of the species.

Mr. F. M. Bailey, "Colonial botanist," sends us his *Catalogue of the Indigenous and Naturalised Plants of Queensland*, brought up to June, 1890. The enumeration contains 3906 species of Phanerogams (of which 204 are naturalised), and 1467 Cryptogams. A "second addenda to third supplement of Synopsis of Queensland Flora," containing descriptions of several new species, is given as an appendix.

Mr. J. H. Maiden has issued as part of the Sydney "Technical Education Series" a pamphlet dealing with *Wattles and Wattle-barks* from a practical point of view. Figures of the principal species of *Acacia* known as "Wattle" add to the usefulness of the work.

We have received the first number of *The South Eastern Naturalist*, "the Journal of the Associated Natural History Societies of the South-East of England." The title is perhaps a little ambitious, for we are informed in the preface that "at present the only Societies in the Association are the East Kent Natural History Society and the Dover Field Club, but it is hoped that others will join." The botanical papers in the present number are "Notes on the Leaf Fungi of 1889," by Mr. W. T. Haydon, and "Notes on the growth of a plant of *Heracleum giganteum*," by Mr. J. Reid.

Mr. H. J. Webber sends us the *Report of the Botanist on the Grasses and Forage Plants, and the Catalogue of Plants*, by Charles E. Bessey and Herbert J. Webber, "extracted from the Report of the Nebraska State Board of Agriculture for 1889," and issued as a separate pamphlet of 162 8vo pages in 1890. Mr. Bessey is responsible for the Report, and Mr. Webber for the Flora, which occupies nearly five-sixths of the work. It is very complete, the Rusts, Mildews, and the like being treated at considerable length. Luerssen's arrangement of the Phanerogams is followed, which gives the sequence of Orders a somewhat unfamiliar appearance. Prof. Bessey's Report deals with practical questions relating to Grasses and their culture.

Dr. N. L. Britton has reprinted from the *Annals of the New York Academy of Sciences* his very useful *List of State and Local Floras of the United States and British America*, brought down to May, 1890.

From the United States Department of Agriculture we have the first half of the first volume of an important work by Dr. George Vasey, entitled *Illustrations of North American Grasses*. The first volume will be devoted to the Grasses of the South-West, while the second will include the Grasses of the Pacific Slope. The part before us contains 50 excellent lithographed figures with descriptions.

From the same Department we have received Nos. 1—3 of *Contributions from the U. S. National Herbarium*. Nos. 1 and 3 are devoted to enumerations of the plants collected by Dr. E. Palmer in California and Mexico, 1888–90, by Dr. Vasey and Mr. J. N. Rose; No. 2 enumerates a collection made in Texas by Mr. G. C. Nealley, and is undertaken by Prof. J. M. Coulter. Each number contains descriptions of many novelties.

Illustrations of West American Oaks, from drawings by the late Albert Kellogg, although published at San Francisco as long ago as April, 1889, reached us but recently. The text is supplied by Prof. E. L. Greene, who also contributes a short introduction. A "sketch of the life and work of Dr. Kellogg," by Mr. G. Davidson, which is prefixed to the work, is chiefly noticeable for its meagreness; although occupying between two and three quarto pages, nothing is said as to the date or place of Kellogg's birth or death, nor is any account given of his botanical work. A similar monograph of the *Coniferæ* is in preparation.

We learn that the *Flora of Tropical Africa*, the last volume of which appeared in 1877, is to be resumed as part of the official work of the Kew Herbarium. Mr. J. G. Baker has the *Loganiaceæ* already in hand. We should, however, have been still more pleased had the long-promised resumption of the *Flora Capensis*, of which nothing has appeared since 1865, been undertaken, especially as certain families—*e. g.* the *Scrophularineæ* by Mr. Hiern—were monographed several years since, and only need bringing up to date to be ready for publication.

Mr. H. C. Hart is engaged in the compilation of a Flora of Donegal.

In the *Botanical Magazine* for December (t. 7149) Sir Joseph Hooker describes Nuttall as "a very eminent American botanist who resided much in England." This is a curious reversal of the facts of the case. A yet more singular instance of the occasional lapses of great men is to be found in the *Proceedings of the Royal Society*, where Sir Joseph states that the late Mr. Ball was educated at "St. Mary's, Oscott, now Stonyhurst." Oscott is in Warwickshire, while Stonyhurst is in Lancashire; and there has never been any connection between the two Colleges. Mr. Ball was an Oscotian.

Science is finding its way into fiction—a reversal of the process which some writers have made popular. A recent novel contains the following passage:—"The garden had been neglected . . . his roses had reverted to type, and bore suckers of *bramble* and large-eyed *roses*" (*The Village Blacksmith*, chap. xx). This "reversion to type" took place in the course of a couple of months or so. What will Mr. Grant Allen say to this?

The Scientific Committee of the Royal Horticultural Society, under the direction of Dr. D. H. Scott, F.L.S., of the Normal School of Science, and Dr. Francis Oliver, F.L.S., of London University, have undertaken to investigate "the effects of London fogs on cultivated plants," and the Royal Society has granted £100 in aid of the experiments.

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WOODS, Tourist's Flora, demy 8vo, cloth, 1850, £2 15s.

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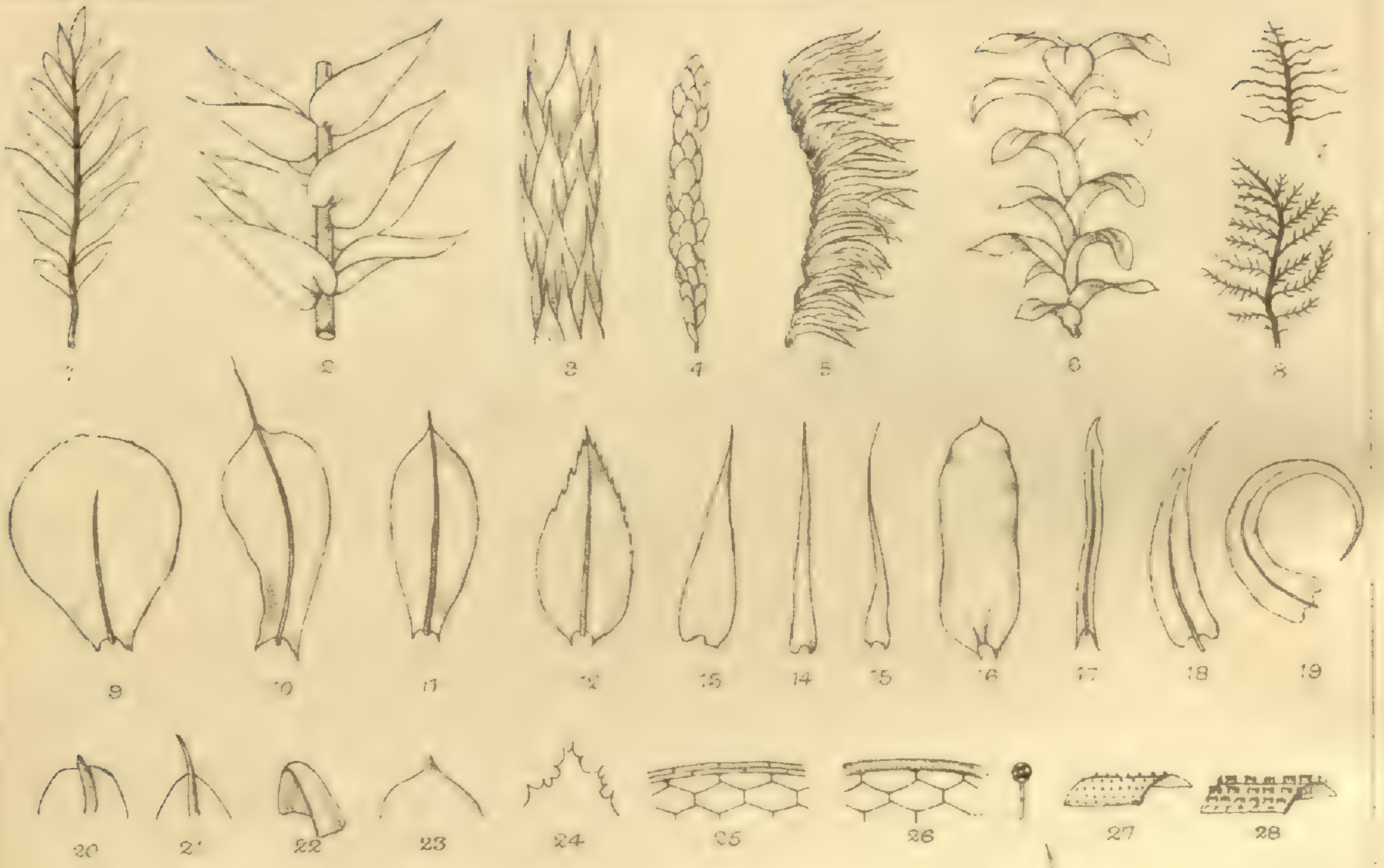
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KEY TO THE GENERA AND SPECIES OF BRITISH MOSSES.

By the Rev. H. G. Jameson.

(Plate 302.)

The following key is not intended to take the place of a more detailed text-book, but merely to serve as a clue by which the student may ascertain in what part of his book he should look for the description of any unknown specimen. There is, I believe, no complete key published for British Mosses, and the existing keys, such as Wilson's, are founded almost entirely on distinctions of the fruit, thus leaving the student quite at a loss with regard to such common and easily distinguished Mosses as *Thuidium tamariscinum*, the Hylocomiums, *Mnium undulatum*, &c., which will probably be among the first he gathers, and none of which are likely to be in fruit. By means of the following key most of the Pleurocarpous Mosses, and many of the Acrocarpous, may be determined even in the barren state. The more minute species among the latter, however, are so unlikely to be gathered, except when in fruit, that they are neglected in the section which deals with barren plants.

The key to the genera is so arranged that the first line after each asterisk forms a heading to the section below it. The Key may therefore be gone through rapidly by reading these headings only, until one of them is reached which applies to the specimen in question, after which the reference-numbers must be followed until the name of the genus is found. It is well to remember, however, that the key must be begun at the beginning, or mistakes will be made. The section, *e. g.*, under the fifth asterisk, headed "Leaves nerveless," does not include *Schistostega*, which had already been separated off in the preceding section. If the student can already recognise the Acrocarpous and Pleurocarpous Groups, he will find that the latter begin at No. 175, but this is not made a primary division in the key, as I have found by experience that beginners take a long time to appreciate the distinctions between the two groups, especially with barren plants. The names of a few genera appear in more than one place in the key. No. 4, for instance, does not imply that all the Phascums have an exserted capsule, as *Phascum* appears again lower down at No. 12.

The nomenclature throughout is that of Hobkirk's *Synopsis*, as that work is likely to be in the hands of every student. Those who possess Dr. Braithwaite's *British Moss Flora* will have already his keys to the species, of which I have, with his kind permission, made frequent use.

The illustrative plate is intended to assist beginners, who may be puzzled by terms to which they have not been accustomed, even in General Botany. It is presumed, however, that the student will not attempt to distinguish individual Mosses without having studied

at least some such elementary introduction as that in Bagnall's *Handbook of Mosses*.

The term "cells," when used without further qualification, refers to the average cells of the upper part of the leaf, say those about one-third of its length from the apex. Cells are described as "lax" when their cavity is 18 μ or more wide, irrespective of its length, and as "close" or "dense" when the cavity is narrower than this.

The following contractions are used in the Key :—

alm. *almost.*
br. *branch.*
cal. *calyptra.*
caps. *capsule.*
exc. *except.*
fl. *flower.*
lanc. *lanceolate.*
ls. *leaves.*
m. or l. *more or less.*
n. *nerve.*
perich. ls. *perichætial leaves.*
perist. *peristome.*
perist. t. *peristome teeth.*
pl. *plant.*
r. *rather.*
sc. *scarcely.*
st. *stem.*
usu. *usually.*
v. *very.*
w. *with.*

The termination "ate" is often omitted ; as, subul. *subulate.*

KEY TO THE GENERA.

*

1 { Branch leaves with spiral fibres in cells ..... *Sphagnum*
  { Cells without spiral fibres 2

*

2 { Caps. opening by slits; pl. blackish, v. fragile ..... *Andreæa*
  { Caps. opening by a lid, or bursting irregularly 3

*

3 { Caps. closed, without lid, usu. immersed, pl. minute 4
  { Caps. with lid (or open); or pl. without fruit 13

4 { Caps. immersed 5
  { Caps. exserted ..... *Phascum*

5 { Pl. growing from persistent green protonema 6
  { Protonema not persistent 7

6 { Ls. more or less lanceolate, tapering to a point ..... *Ephemerum*
  { Ls. narrow-lingulate, usu. recurved ..... *Ephemerella*

7 { Caps. sessile, globose; spores few, large, angular ..... *Archidium*
  { Caps. shortly stalked, usu. pointed; spores smaller, rounded 8

8 { Caps. with minute, persistent lid; ls. curled when dry ..... *Systegium*
  { Caps. without a distinct lid; ls. scarcely curled 9

9 { Ls. lanceolate or subulate, smooth ..... *Pleuridium*
  { Ls. ovate, ovate-lanceolate, or obovate 10

10 { Ls. serrate above, n. vanishing; cells v. lax ..... *Physcomitrella*
   { Ls. entire, or erose near apex; n. usu. excurrent 11

11 { Caps. globose, not (or obscurely) pointed; 2 or 3 inner perich. ls. v. large and concave, usu. serrul. at apex ..... *Sphærangium*
   { Caps. apiculate; ls. entire, tapering 12

12 { Pl. brownish; ls. ovate-acumin.; cal. conic, lobed ..... *Microbyrum*
   { Pl. usu. green; ls. oblong-lanceolate; cal. cucullate ..... *Phascum*

*

13 { Ls. distichous, inserted in 2 vertical rows on the stem.....14
Ls. inserted in several rows †.....16

14 { Ls. v. narrow, subulate-setaceous.....*Distichium*
Ls. wider, lanceolate or ovate-lanceolate.....15

15 { Ls. nerved, with sheathing lamina at base .....*Fissidens*
Ls. nerveless, without sheathing lamina .....*Schistostega*

*

16 { Ls. nerveless (or 2-nerved), in some cases rudimentary only 17
Ls. singly nerved 21

17 { Pl. alm. stemless; ls. few and minute, round base of seta 18
St. longer; ls. numerous.....20

18 { Caps. erect; peristome of 4 teeth only .....*Tetrodontium*
Caps. inclined; peristome of more than 4 teeth.....19

19 { Caps. subglobose, cernuous; peristome single .....*Discelium*
Caps. gibbous, flattened above; peristome double .....*Buxbaumia*

20 { Ls. spongy, whitish, of more than one layer of cells .....*Leucobryum*
Ls. not spongy, of one layer only 175

*

21 { Nerve with vertical lamellæ on inner face; perist. t. connected by a tympanum; ls. long, usu. narrow 22
Nerve w. lamellæ; perist. absent or rudimentary; ls. v. short, obovate, concave, n. excurrent in a hair.....25
N. without lamellæ; perist. (if any) without tympanum 26

22 { Nerve w. about 3—12 lamellæ; calyptra almost naked.....23
Nerve v. broad, much lamellated; cal. v. hairy.....24

23 { Ls. bordered; lamellæ about 3—6, straight..... *Atrichum*
Ls. not bordered; lamellæ about 10—12, sinuous.....*Oligotrichum*

24 { Capsule four- to six-angled .....*Polytrichum*
Capsule cylindric or rounded, not angled .....*Pogonatum*

25 { Caps. oval; seta short; lid-cells in vertical lines .....*Pottia*
Caps. cylindric, on longer seta; cells of lid arranged in spiral lines.....*Barbula lamellata*

*

26 { Ls. with white hyaline points 27
Ls. without hyaline points (or whole leaf colourless).....32

27 { Ls. m. or l. tapering to hyaline points 28
Ls. oblong or spathul. usu. obtuse, n. excurrent in a hair 31

28 { N. over $\frac{1}{3}$ of leaf near base; ls. m. or l. subul.....*Campylopus*
Nerve narrow; ls. m. or l. ovate or lanceolate 29

29 { Basal cells of ls. v. long and narrow, v. nodulose.....*Racomitrium*
Basal cells not nodulose (or sometimes sinuous only) 30

30 { Perist. double; caps. immersed, striate.....*Orthotrichum diaphanum*
Perist. absent or single; caps. immersed or exserted .....*Grimmia*

31 { Peristome absent; plant very small .....*Pottia*
Peristome single, twisted; plant usually larger .....*Barbula*

*

32 { Plant without fruit.....121
Plant with fruit.....33

---

† Sometimes *complanate*, i.e., flattened against the stem so as to appear as if distichous; see No. 175.

*

33 { Peristome absent (or rudimentary) 34
Peristome present 49

34 { Caps. drooping, subglobose .....*Bartramidula*
Caps. erect or suberect (or immersed) 35

35 { Caps. striate, regularly furrowed when dry.....36
Caps. smooth (or irregularly sulcate only when dry) 37

36 { Ls. long, linear-lanc., not squarrose; seta v. short .....*Amphoridium*
Ls. widely lanc., subsquarrose; seta longer .....*Zygodon*

37 { Caps. immersed 38
Caps. exserted (or subimmersed in *Hymenost. rostellatum*) 39

38 { Pl. v. small; lid minute; ls. papillose .....*Systegium*
Lid larger, deciduous; ls. smooth, rigid.....*Blindia cæspiticia*

39 { Cal. long, cylindric, covering capsule; ls. large, opaque, with v. large multifid papillæ .....*Encalypta*
Cal. small; ls. smooth, or with smaller papillæ.....40

40 { Ls. m. or l. ovate, oblong, or rounded; cells usu. lax 41
Ls. lanc. or subulate; cells close 45

41 { Ls. roundish, v. obtuse, seta thick .....*Œdipodium*
Ls. not rounded, acute or with excurrent nerve.....42

42 { N. usu. excurrent; cells short; lid beaked or conic .....*Pottia*
N. ceasing below apex; cells long; lid conic or convex 43

43 { Ls. distinctly bordered; lid nearly flat .....*Entosth. ericetorum*
Ls. not bordered 44

44 { Lid alm. flat, its cells in spiral lines .....*Funaria fascicularis*
Lid usu. conic, w. cells in straight lines .....*Physcomitrium*

45 { Pl. minute, on stone; ls. subulate, smooth .....*Seligeria Doniana*
Ls. lanc. or linear, usu. papillose; pl. usu. larger 46

46 { N. excurrent; caps. partly closed at mouth .....*Hymenostomum*
N. not excurrent; caps. open at mouth 47

47 { Lid conico-rostellate; annulus broad; ls. r. obtuse.....*Gyroweissia*
Lid rostrate; annulus narrow or absent 48

48 { Seta terminal; ls. linear-lanceolate .....*Gymnostomum*
Seta on a short branch; ls. r. shortly lanceolate ..... *Anœctangium*

*

49 { Peristome of 4 simple undivided teeth.....50
Peristome of more than 4 teeth.....51

50 { Pl. alm. stemless; with radical nerveless ls.....*Tetrodontium*
Stem leafy; barren stems bearing gemmiferous cups.....*Tetraphis*

*

51 { Capsule immersed 52
Capsule exserted 56

52 { Pl. alm. stemless; perich. ls. ciliated; caps. oblique .....*Diphyscium*
Perichætial ls. not. ciliated; caps. regular 53

53 { Fruit terminal 54
Fruit on a short lateral branch 55

54 { Capsule not striate; peristome single .....*Grimmia*
Capsule striate, or smooth with double peristome .....*Orthotrichum*

55 { Ls. with thickened border; peristome single; st. long.....*Cinclidotus*
Leaves not bordered; peristome double .....*Cryphæa*

*

56 { Stem evidently pinnate or bipinnate 175
Stem not evidently pinnate 57

*

57 { Peristome double 99
Peristome single 58

*

58 { Seta bent or curved downwards when moist 59
Seta straight (the caps. itself either erect or cernuous).....63

59 { N. wide (about ⅓ of leaf below); apex subulate 60
Nerve narrow 61

60 { Capsule striate .....*Campylopus*
Capsule smooth .....*Dicranodontium*

61 { Pl. tall, dark green; n. 2-winged at back above .....*Racomitr. patens*
Plant minute; nerve not winged 62

62 { Seta geniculate; perist. t. narrow, usu. divided .....*Campylostelium*
Seta curved; perist. t. lanceolate, usu. entire.....*Seligeria*

*

63 { Perist. t. 16, simple, or slightly and irregularly cloven, or united into 8 64
Perist. t. 16, m. or l. deeply divided, or 32.....85

64 { Calyptra cylindric, beaked, covering the caps.: ls. large, oblong, opaque, w. large, multifid papillæ .....*Encalypta*
Cal. not covering caps.; ls. smooth, or finely papillose 65

65 { Caps. w. apophysis as wide or wider than itself; (cells lax) 66
Neck swollen or tapering, but narrower than capsule 67

66 { Ls. with long flexuose points .....*Tetraplodon*
Ls. obtusè, or with shorter points .....*Splachnum*

67 { Capsule striate, regularly furrowed when dry.....66
Caps. not striate (or irregularly sulcate when dry only) 73

68 { Capsule subglobose 69
Capsule not globose.....70

69 { Perist. t. united into a cone; caps. cernuous .....*Conostomum*
Perist. t. free; capsule erect .....*Bartramia stricta*

70 { Perist. t. 8, or 16 approached in pairs 71
Perist. t. 16 equidistant 72

71 { Calyptra mitriform, plicate 108
Cal. cucullate, smooth; perist. w. rudimentary cilia.....*Zygodon*

72 { Pl. minute; perist. t. v. short, truncate; ls. subul... *Brachydontium*
Perist. t. not truncate; ls. linear or ligulate.....*Rhabdoweissia*

73 { Ls. lingulate, obtuse, entire; cells lax.....*Dissodon*
Plant without lingulate obtuse leaves 74

74 { Seta on a branch; ls. lanc. w. narrow pointed cells .....*Mielichoferia*
Seta terminal; cells not pointed at the ends 75

75 { Capsule with elongated neck; cells lax 76
Caps. without long neck; cells close (exc. some of *Pottia*) 77

76 { Perist. t. strongly reflexed when dry; ls. serrate .....*Tayloria*
Perist. t. erect when dry; ls. superficially toothed.....*Entosthodon*

77 { Caps. horizontal, globose, v. small, dark, shining..... *Catoscopium*
Capsule erect or suberect 78

78 { Perist. t. paired, reflexed when dry; cal. plicate .....*Glyphomitrium*
Perist. t. not paired; calyptra not plicate 79

79 { Caps. shortly obovate or pyriform; ls. subul., smooth 80
Caps. m. or l. oval or cylindric; ls. usu. papillose.....81

80 { Plant minute; angular cells of ls. not coloured.....*Seligeria*
Pl. larger; angular cells enlarged, brownish.....*Blindia acuta*

81 { Ls. short, ovate-lanc. w. excurrent nerve; or v. widely ovate and imbricate in a bulb-like tuft; cells r. lax.....*Pottia*
Ls. without these combined characters; cells close 82

82 { Perich. ls. distinct, short, sheathing (ls. entire).....*Dicranoweissia*
No distinct perichætium 83

83 { Ls. glaucous-green, serrul. near base, entire above .....*Eucladium*
Ls. not glaucous, either serrul. above, or entire throughout 84

84 { Ls. linear-lanc., entire, n. excurrent; perist. t. simple .....*Weissia*
N. rarely excurrent; perist. t. m. or l. divided.....*Didymodon*

*

85 { Perist. t. 16, well developed, regularly cloven about half-way into 2 filiform legs 86
Perist t. 16, divided (m. or l. regularly) alm. to base; or 32 90

86 { Ls. with enlarged, usu. brownish, angular cells .....*Dicranum*
Ls. without special angular cells 87

87 { Leaves papillose 88
Leaves smooth 89

88 { Caps. striate; ls. crisped when dry .....*Cynodontium*
Caps. smooth; ls. subsquarrose, scarcely crisped.....*Dichodontium*

89 { Pl. tall; ls. acute, spreading; caps. v. strumous .....*Cynodontium*
Pl. small; or tall, w. v. obtuse, entire, squarrose ls. .....*Dicranella*

*

90 { Perist. t. 16, divided nearly to base, or 32 91
Perist. t. 16, less regularly divided 93

91 { Perist. t. spirally twisted.....*Barbula*
Peristome not twisted.....92

92 { Pl. usu. tall; ls. dark green, opaque, entire (or nearly), lower cells nodulose or sinuous, upper often bi-stratose.....93
Leaf-cells not nodulose; ls. rarely bi-stratose 94

93 { Lower cells v. narrow, strongly nodulose .....*Racomitrium*
Cells wider, sinuous only; per. t. usu. less cleft .....*Grimmia*

94 { Caps. striate, furrowed when dry; ls. lanc. .....*Ceratodon*
Capsule not striate 95

95 { Capsule with neck as long as itself.....*Trematodon*
Capsule without elongated neck 96

96 { Cal. plicate; ls. long, tapering, m. or l. plicate .....*Ptychomitrium*
Calyptra smooth; ls. not plicate 97

97 { Ls. smooth, m. or l. subul. (or glaucescent and lanc.) .....*Ditrichum*
Ls. usu. papillose, linear-lanc., lanc., or wider 98

98 { Perich. ls. short, sheathing; perist. t. v. small .....*Dicranoweissia*
No distinct perichætium; perist. t. usu. longer and more developed (*Trichostom.* and *Didym.*, see under) .....*Didymodon*

*

99 { Seta at end of stem, or of an (apparent) branch.....100
Seta (with its perich. ls.) at side of stem, or of a branch 175

100 { Outer perist. curved spirally; cal. inflated; cells lax .....*Funaria*
Outer perist. not spirally curved; cal. not inflated below.....101

101 { Capsule distinctly striate, furrowed when dry 102
Capsule smooth, or obsoletely striate 110

102 { Capsule globose.....103
Capsule more or less oval or cylindric.....105

103 { Seta arcuate; ls. alm. squarrose, ovate-lanc., striate.....*Breutelia*
Seta straight (exc. *B. Halleriana*); ls. imbric. or spreading 104

104 { Ls. ovate, or ovate-lanc.; brs. usu. fascicled above .....*Philonotis*
Ls. lanc. or subul.; branches not fascicled .....*Bartramia*

105 { Capsule with spiral striæ .....*Encalypta streptocarpa*
Capsule with vertical striæ.....106

106 { Capsule erect; outer perist. t. more or less paired 107
Caps. inclined or horizontal; persist. t. not paired 109

107 { Calyptra mitriform, plicate.....108
Calyptra cucullate, smooth .....*Zygodon*

108 { Caps. much exserted, w. superficial stomata; ls. crisped when dry (exc. *U. Hutchins.*); basal cells v. narrow .....*Ulota*
Caps. usu. less exserted, stomata immersed (exc. *O. speciosum*); ls. m. or l. imbric. when dry, basal cells wider .....*Orthotrichum*

109 { Ls. long, acute, from sheathing base, serrate above.. .....*Timmia*
Ls. not sheathing, entire, or toothed at apex.....*Aulacomium*

110 { Ls. linear-setaceous; plant small.....111
Ls. not setaceous 112

111 { Capsule suberect, clavate .....*Orthodontium*
Capsule cernuous, pyriform .....*Leptobryum*

112 { Inner perist. reticulated; ls. roundish, entire .....*Cinclidium*
Inner perist. of separate teeth 113

113 { Caps. suberect or inclined; outer perist. t. much shorter than inner; ls. m. or l. lingulate 114
Caps. usu. horizontal or pendulous, rarely suberect; outer teeth rarely shorter than inner 115

114 { Leaves obtuse, entire; cells dense .....*Meesia*
Ls. acute, usu. serrulate at apex; cells lax .....*Amblyodon*

115 { Ls. large, roundish, entire, obtuse or shortly apiculate.....*Mnium*
Plant without large, rounded, entire leaves 116

116 { Ls. w. strong cartilaginous toothed border; or not bordered and serrate, with lax rounded-hexagonal cells .....*Mnium*
Ls. without such border; cells hexagono-rhomboid 117

117 { Seta cygneous, short; caps. v. long-necked, oblique .....*Zieria*
Seta not cygneous, longer in proportion to capsule 118

118 { Cilia of inner perist. w. hooked appendages (see also No. 149)...*Bryum*
Cilia without appendages, either imperfect or perfect 119

119 { Caps. narrow-clavate or oblong, w. long neck.....*Webera*
Caps. distinctly pyriform, or roundish-pyriform 120

120 { Pl. dioicous (*W. cruda* also synoic.), or monoicous w. naked axillary antheridia; ls. usu. m. or l. lanceolate .....*Webera*
Pl. synoicous, or monoicous w. terminal gemmiform male flowers; ls. usu. more or less ovate .....*Bryum*

*

121 { Stem evidently pinnate or bipinnate 175
Stem not evidently pinnate 122

*

122 { Nerve excurrent 124
Nerve vanishing in or below apex of leaf.....123

*

123 { Stem (Acrocarpous) usu. erect or ascending, simple or dichotomously divided, v. rarely w. true lateral branches; leaf-cells usu. quadrate, rounded, or truncate-hexagonal, rarely (as in *Bryaceæ*, &c.) hexagono-rhomboid 124
Stem (Pleurocarpous) usu. prostrate or creeping, often long and w. many lateral branches; leaf-cells most frequently rhomboid or linear, or oval or rounded, sc. ever quadrate 175

124 { Ls. w. long, narrow, subulate or setaceous points 125
Ls. without long subulate points 134

125 { N. v. broad, about ⅓ or more of width of leaf near base 126
Nerve narrow 128

126 { Ls. suddenly narrowed above base to a long subula 127
Ls. more gradually subulate .....*Campylopus*

127 { Basal auricles of ls. large and inflated .....*Dicranodontium*
Basal auricles slightly developed or absent .....*Dicranum*

128 { Ls. auricled with enlarged, brownish, angular cells 129
Ls. without dilated and coloured angular cells 130

129 { Ls. entire, much crisped when dry .....*Dicranoweissia*
Ls. entire, not crisped, r. short, not or sc. secund.....*Blindia*
Ls. usu. serrulate, rarely crisped, often secund .....*Dicranum*

130 { Ls. much crisped when dry 131
Ls. not or only slightly crisped 132

131 { Leaves serrulate above .....*Cynodontium*
Leaves entire, or subentire .....*Barbula*

132 { Ls. papillose at back from projecting cell-partitions 103
Leaves smooth 133

133 { St. tall, flexuose; ls. long, alm. setaceous .....*Ditrichum flexicaule*
Stem and ls. short .....*Ditrichum*, *Dicranella*, *Seligeria*, &c.

134 { Ls. w. strong, cartilaginous, toothed border .....*Mnium*
Ls. without cartil. border (or bordered and subentire) 135

135 { Ls. large, roundish, entire, obtuse or apiculate 136
Plant without large, roundish, entire leaves 138

136 { Ls. not bordered; margin m. or l. ciliated near base ...*Œdipodium*
Ls. not bordered, cells roundish or widely hexag. .....*Splachnum*
Ls. bordered (exc. *M. cinclidioides*, w. long, narrow cells) 137

137 { Ls. strongly apiculate .....*Cinclidium*
Ls. obtuse or obscurely apiculate .....*Mnium*

138 { Pl. bearing stalked globular heads of gemmæ .....*Aulacomium*
Pl- w. terminal gemmiferous cups w. obcordate ls. .....*Tetraphis*
Pl. without terminal cups or stalked masses of gemmæ 139

139 { Ls. (often serrate) w. brownish, swollen, angular cells.....*Dicranum*
Ls. without coloured auricles of swollen cells.....140

140 { Ls. w. basal cells strongly nodulose, v. narrow .....*Racomitrium*
Ls. without long nodulose cells at base 141

141 { Ls. with cells m. or l. elongate in upper half.....142
Ls. w. upper cells short, m. or l. quadrate or rounded.....150

142 { Ls. papillose from projecting cell-partitions; serrate 143
Ls. not papillose; serrate or entire 144

143 { Pl. in small, v. dense tufts; ls. lanc. imbric.....*Conostomum*
Pl. usu. larger, less densely tufted 103

144 { Ls. soft, cells lax, mostly flattened at the ends 145
Ls. firmer; cells either narrow w. flat ends, or pointed at the ends and either wide or narrow 147

145 { Ls. lingulate or oblong 146
Ls. ovate, obovate, or roundish .....*Funariaceæ* and *Sphlachnaccæ*

146 { Ls. obtuse, entire .....*Dissodon*
Ls. acute, usu. serrulate at apex.....*Amblyodon*

147 { Leaves strongly squarrose, v. obtuse .....*Dicranella*
Leaves not squarrose 148

148 { Ls. obtuse, entire; cells w. flat ends .....*Meesia*
Ls. usu. m. or l. acute; cells w. pointed ends 149

149 { Ls. widely ovate, v. imbric.; cells lax.....*Zieria* and *Bryum argent.*
Ls. usu. lanc.; n. rarely reaching apex .....*Webera*
Ls. usu. m. or l. ovate; n. usu. to apex or excurrent.....*Bryum*

150 { Leaves serrate above 151
Leaves entire, or slightly toothed near apex only 159

151 { Ls. ovate; cells rounded-hexagonal, v. lax .....*Mnium stellare*
Cells close, rarely hexagonal 152

152 { Leaves more or less squarrose 153
Leaves not squarrose 157

153 { Ls. shortly and widely ovate, acute, v. much recurved.....*Paludella*
Ls. more or less oblong or lanceolate 154

154 { Ls. obtuse, or subacute only, coarsely papillose.....*Dichodontium*
Ls. acute, finely papillose 155

155 { Ls. v. acumin., w. basal margin of hyaline cells.....*Barbula squarr.*
Ls. w. shorter, less tapering points 156

156 { Ls. r. coarsely eroso-serrate; upper cells quadrate.....*Didymodon*
Ls. less serrate; upper cells dot-like .....*Zygodon Nowellii*

157 { Ls. oblong-lanc., subacute (papillose) .....*Aulacomium*
Ls. w. long, narrow points 158

158 { Ls. coarsely serrate above, smooth, incurved when dry .....*Timmia*
Ls. finely serrate, usu. papillose, crisped when dry.....*Cynodontium*

159 { Ls. broad, oblong or spathulate, obtuse or w. excurrent n. 160
Ls. narrow, lanceolate or linear.....164

160 { Ls. opaque above: cells dense, m. or l. quadrate 161
Cells rounded, clear, incrassate, less dense 163

161 { Ls. large, oblong, usu. obtuse, or w. shortly excurrent nerve; with v. large multifid papillæ above .....*Encalypta*
Ls. smooth or w. smaller papillæ, or else w. hair-points 162

162 { Stem v. elongate, aquatic; ls. w. thickened border .....*Cinclidotus*
Stem less elongate, usu. terrestrial .....*Barbula*

163 { Plant dull-green; ls. smooth or finely papillose .....*Orthotrichum*
Pl. pale green; cells each conically prominent .....*Aulacomnium*

164 { Upper ls. tipped w. clustered gemmæ.....*Ulota phyllantha*
Ls. not tipped with gemmæ in clusters 165

165 { Ls. lanc., tapering, margin recurved, at least in lower half.....166
Ls. usu. linear-lanc., margin alm. plane or incurved 168

166 { Ls. long, dark-green, opaque, obtuse or subacute .....*Orthotrichum*
Ls. acute, or short and subacute 167

167 { Pl. v. red below, or lurid-green w. short wide leaves.....*Didymodon*
Pl. green or red-brown below; ls. usu. lanc. .....*Barbula*, &c.

168 { Ls. glaucous-green, serrate near base, entire above.....*Eucladium*
Leaves entire below.....169

169 { Ls. w. basal hyaline cells ascending up margin of leaf.....170
Basal hyal. cells (if present) not ascending up margin 171

170 { Leaves arcuato-incurved when dry .....*Trichostomum*
Leaves more or less crisped when dry .....*Barbula*

171 { N. excurrent in a mucro; cells opaque...*Trichostomum*, *Weissia*, &c.
Ls. subsquarrose, n. usu. vanishing; cells dotted, clear .....*Zygodon*
Ls. spreading; n. vanishing; pl. in dense cushions 172

172 { Tufts compact, bright green above; ls. r. short .....*Anœctangium*
Ls. long and narrow, usu. duller or paler green.....173

173 { Ls. acute, linear-lanc,; cells minute, opaque.....174
Ls. usu. lanc.; subacute, or acute w. pellucid cells ...*Gymnostomum*

174 { Ls. curled up, or merely flexuose when dry .....*Amphoridium*
Ls. crisped and twisted when dry .....*Didymodon*

[Pleurocarpous Mosses, with Cladocarpous.]

*

175 { Ls. distinctly complanate 176
Ls. not, or scarcely, complanate.....182

176 { Ls. nerveless, or two-nerved 177
Ls. singly nerved..... 180

177 { Ls. bordered, two-nerved more than half-way.....*Hookeria*
Ls. not bordered; nerveless, or v. shortly two-nerved 178

178 { Ls. v. obtuse, subsucculent; cells v. lax .....*Pterygophyllum*
Ls. not succulent: cells narrow.....179

179 { Branches pinnate; ls. usu. undulate .....*Neckera*
Brs. not pinnate; ls. flat (exc. *P. undulatum*).....† *Plagiothecium*

180 { Ls. distichous, with sheathing lamina at base.....*Fissidens*
Ls. not distichous, without sheathing lamina.....181

181 { Ls. obtuse, or v. shortly apiculate .....*Homalia*
Ls. acute or subacute (usu. subcomplanate only) 214

*

182 { Ls. strongly and uniformly falcato-secund .....*Hypnum*
Ls. not falcato-secund 183

*

183 { Stem clothed throughout w. numerous (usu. branched) villi 184
Stem not obviously villous.....186

184 { Ls. v. papillose at back, nerved; st. markedly pinnate ...*Thuidium*
Ls. smooth; stem irregularly or scarcely pinnate.....185

185 { St. usu. red; ls. m. or l. widely ovate, usu. nerveless ...*Hylocomium*
St. not red; ls. nerved, ovate-lanc., w. long acumen.....*Ptychodium*

*

186 { Ls. w. white hyaline points (nerveless or 2-nerved) .....*Hedwigia*
Ls. without hyaline points 187

*

187 { Ls. w. long, curved, spinulose papillæ at back .....*Pterigynandrum*
Ls. smooth, or m. or l. finely papillose 188

*

188 { Ls. nerveless, or shortly two-nerved 189
Ls. singly nerved 212

189 { Pl. robust, st. red; ls. scarious, acumin.; cells linear...*Hylocomium*
Stem not red (exc. in No. 202, with obtuse ls.) 190

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† Including *Rhyncostegium depressum*; see under *Plagiothecium*.

190 { Ls. strongly plicate when moist, acuminate 191
Ls. not plicate, or only subplicate when moist 192

191 { Cells all long and narrow 198
Cells oval, shorter at sides of leaf below middle .....*Leucodon*

192 { Leaf-cells all short, not twice as long as wide; or long-oval in centre and short at sides of leaf 193
Cells all long and narrow (exc. at angles only) 198

193 { Ls. subplicate, w. margin recurved alm. to apex .....*Hedwigidium*
Ls. not plicate when moist; margin plane in upper part.....194

194 { Ls. quite entire, smooth 195
Ls. more or less serrulate 196

195 { Ls. w. rounded, subacute points; cells r. lax.....*Myrinea*
Ls. w. long, narrow acumen .....*Habrodon*

196 { Ls. serrate above, smooth, over half a line long .....*Pterigonium*
Ls. finely serrulate, usu. papillose, v. small 197

197 { Ls. roundish, obtuse or apiculate, v. concave and imbric....*Myurella*
St. ls. acute or acuminate, squarrose or spreading ...*Heterocladium*

198 { St. long, usu. floating; ls. 3-ranked; caps. immersed.....*Fontinalis*
Ls. not 3-ranked; caps. exserted 199

199 { Ls. v. concave, imbric., serrul., with v. long apiculus .....*Myurium*
Ls. without elongated apiculus 200

200 { Branch ls. m. or l. obtuse or apiculate, usu. entire 201
Ls. acute or acuminate 203

201 { Terrestrial plant 202
Aquatic or marsh plant.....*Hypnum*

202 { St. and ls. pale; auricles of small, opaque cells.....*Cylindrothecium*
St. red, or else auricles of large, thin cells.....*Hypnum*

203 { Ls. distinctly toothed above 204
Ls. entire (exc. at extreme apex only) 206

204 { St. ls. wide-ovate, sharply serrate, shortly acum. .....*Hyocomium*
Ls. finely serrulate, with long, fine acumen 205

205 { Ls. strongly squarrose-recurved.....*Hypnum Halleri*
Ls. spreading or subsecund.....*Plagiothecium*

206 { Plant v. slender, conferva-like; ls. v. minute.....*Amblystegium*
Plant usu. larger, with easily visible leaves.....207

207 { Ls. acute, or shortly acuminate.....208
Ls. with long narrow acumen 209

208 { Ls. elliptic-lanc., margin recurved throughout...*Rhyncost. demissum*
Margin erect, exc. at base.....*Hypnum*

209 { Ls. m. or l. squarrose, or very spreading .....*Hypnum*
Ls. imbricate (and plicate), or subsecund 210

210 { Ls. reddish, m. or l. plicate, at least when dry .....*Orthothecium*
Ls. not reddish nor plicate 211

211 { Capsule erect, lid conic; ls. ovate below.....*Pylaisia*
Caps. cernuous, or erect w. rostrate lid; ls. lanc. .....*Hypnum*

*

212 { Ls. with a distinct border 213
Ls. not evidently bordered 214

213 { St. long, aquatic; n. reaching apex or excurrent .....*Cinclidotus*
St. v. short, terrestrial; nerve not reaching apex .....*Daltonia*

*

214 { Cells short, not twice as long as wide (often papillose).....215
Cells at least 2 or 3 times as long as wide (smooth) 224

215 { St. dendroid; ls. serrate above (smooth); pl. tall, rigid...*Thamnium*
St. not dendroid; ls. entire, or finely serrul. near apex 216

216 { Ls. v. obtuse, small, ovate; brs. pinnate or bipinnate .....*Leptodon*
Ls. acute, or obtuse and long-lingulate 217

217 { Caps. immersed (rarely absent); ls. ovate, entire .....*Cryphæa*
Caps. exserted; plant often barren 218

218 { Nerve ceasing about half-way up the leaf 219
Nerve reaching nearly or quite to apex 221

219 { Ls. serrulate above; st. ls. larger than br. ls. .....*Heterocladium*
Ls. entire; st. ls. not larger than br. ls. 220

220 { Ls. soft, smooth, margin plane; cells rather lax .....*Myrinea*
Ls. subpapillose, margin reflexed; pl. v. slender .....*Pseudoleskea*

221 { Ls. smooth, serrulate at apex .....*Lescuræa*
Ls. papillose, entire (exc. *Pseudoleskea atrovirens*) 222

222 { Stem creeping, stoloniferous; cells usu. opaque .....*Anomodon*
Plant not stoloniferous; cells more distinct 223

223 { Capsule erect; ls. quite entire.....*Leskea*
Caps. m. or l. cernuous; ls. usu. serrulate at apex .....*Pseudoleskea*

*

224 { Ls. without recurved teeth at apex 225
Ls. with sharp recurved teeth at apex, margin revolute...*Antitrichia*

225 { Ls. v. plicate, w. long narrow acumen, m. or l. imbricate 226
Ls. not plicate, or plicate with shorter points.....228

226 { Ls. lanceolate, tapering alm. from base (cells linear) 227
Ls. wider at base, ovate-lanceolate .....*Brachythecium*

227 { Stem creeping, branches incurved; caps. erect .....*Homalothecium*
St. erect; ls. usu. yellowish; caps. inclined.....*Camptothecium*

228 { Caps. erect; stem dendroid, bare below, branched above.....229
Caps. m. or l. cernuous or inclined; stem not dendroid 230

229 { Br. ls. obtuse, plicate, sharply serrate above.....*Climacium*
Ls. not plicate, rather acute, serrulate only .....*Isothecium*

230 { Ls. v. concave, imbric., w. long genicul. apiculus.....*Brachythecium*
Ls. without long sharply bent apiculus.....231

231 { Ls. obtuse, or very shortly apiculate.....232
Ls. acute or acuminate 233

232 { Ls. entire, cells linear .....*Hypnum*
Ls. serrulate, cells usu. shorter and wider 233

233 { Lid of caps. with a long beak (ls. often serrulate) 234
Lid conic, acute or shortly apiculate only 235

234 { St. irregul. branched, scarcely stoloniferous .....*Rhyncostegium*
St. often pinnate, usu. stoloniferous .....*Eurhynchium*

235 { Seta smooth; ls. usually entire 236
Seta rough in whole or in part 238

236 { Ls. alm. squarrose, w. long fine acumen (cells linear) .....*Hypnum*
Ls. erecto-patent or subsecund 237

237 { Ls. w. distinct swollen auricles; cells usu. linear .....*Hypnum*
Ls. not (or sc.) auricled; cells usu. wider .....*Amblystegium*

238 { Cells alm. linear; ls. v. concave; brs. usu. incurved ...*Scleropodium*
Cells narrowly hexagono-rhomboid.....*Brachythecium*

Description of Plate 302.

The *plant* may grow from its own roots (43), or from a persistent, green, conferva-like protonema (42).

The *stem* may be smooth (2), or villous (62); simple (1, 43), or more or less branched; the branches being pinnate (7), bipinnate (8), or irregular.

The *leaves* are either stem-leaves (*i.e.*, those growing on the main stem), branch-leaves, or perichætial-leaves (61).

In *direction* they may be distichous or two-ranked (1), complanate, *i.e.*, compressed so as to appear as if distichous (2), imbricate (3, 4), secund (5), squarrose (6), or spreading (61).

In *shape* they may be orbicular or roundish (9), spathulate (10), obovate (11), ovate (12), lanceolate (13), subulate (14), setaceous (15), lingulate or oblong (16), linear (17), falcate (18), circinate (19), plicate (29), undulate (16), auricled (30), decurrent (38), or with sheathing lamina at base (39).

The *apex* may be acute (12, 39), acuminate (13, 14), apiculate (23), obtuse (4, 9), cucullate (22), mucronate (20), cuspidate (21), diaphanous or hyaline (40).

The *margin* may be entire (9, 10, 11), serrate (12), erose (24), bordered with narrow cells (25), or with thickened border (26).

The *surface* may be smooth, or finely (27) or coarsely (28) papillose.

The *nerve* may be absent (13), single (9, 12), double (16), excurrent (11, 21), forming a hair-point (10), or vanishing in (39) or below (9, 18) the apex, and may bear lamellæ on its surface (41).

The *cells* may be quadrate (35), rounded (36), hexagonal with flat ends (32), hexagono-rhomboid (33), linear (34), nodulose (37), containing spiral fibres (31); parenchymatous, *i.e.*, with opposing flattened ends (32, 35, 37), or prosenchymatous, *i.e.*, with overlapping pointed ends (31, 33, 34).

The *fruit* may be terminal (42, 43), or lateral (61).

The *capsule* may be immersed (42), or exserted (43); opening by slits (44), or with (45, 52, 66) or without (42, 46) a deciduous lid; erect (48, 54), inclined (56, 66), cernuous (49), pendulous (45), regular (48), or oblique or curved (49, 56, 60); globose (52), turbinate or obovate (47), oval (48), cylindric (54), pyriform (45), angled (55), with a long (66) or strumous (56) neck, or with a swollen apophysis (53); striate (52), or smooth (48, 50); with the mouth open (47), or partly closed by a diaphragm (59).

The *peristome* may be absent (54), single (48, 50, 56), or double (49); the teeth may be entire (48, 53), cloven (58), paired (57), twisted (50), connected by a tympanum (51); either erect (48) or reflexed (53, 57), when dry.

The *lid* may be convex, conic, mamillate (45), rostellate (66), or rostrate or beaked (55).

The *calyptra* may be mitriform (63), dimidiate (64), cucullate (65).

Gemmæ occur either separately, or gathered in terminal cups (67), or heads.

JOSÉ JERONIMO TRIANA.

José Jeronimo Triana, who died in Paris on October 31st, 1890, after a serious surgical operation, was a native of Colombia, and was born in 1828. He was intended for the medical profession, and his studies had been directed towards that end. The government of New Granada, however, undertook a more or less complete scientific exploration of the country, and Triana was entrusted with the investigation of the flora, in pursuit of which he travelled for many years in all the provinces of the country. It was at this period that he became acquainted with Karsten, in conjunction with whom he published some new plants from Colombia, but this collaboration was of short duration. In 1864, Triana published at Santa Fé de Bogota a quarto pamphlet of twenty-eight pages, entitled *Nueros jéneros e especies de plantas para la Flora Neogranadina*. When his collections were considered sufficiently complete, Triana went to Paris, where he established himself with his family. Many of his plants were given to certain European herbaria, and one collection was acquired by the Paris Museum. The most complete series remained in Triana's possession, and was entrusted by him to Decaisne. Himself little experienced in the study of plants, Triana sought a coadjutor who could help in the publication of his projected Flora. Through the agency of Decaisne, this position was accepted by Planchon under somewhat stringent conditions, who abandoned the work as soon as the slender grant made by the Colombian government was exhausted. Thus the *Prodromus Floræ Novo-granatensis*, printed in the *Annales des Sciences Naturelles* (1862–67), extends only to 382 pages, and includes but a few families of Phanerogams. The Cryptogams received better treatment at the hands of A. Braun (Lycopods), Mettenius (Ferns), Léveillée (Fungi), Gottsche (Hepatics), Hampe (Mosses), and Nylander (Lichens).

Left to himself, Triana devoted himself for several years to the study of the *Melastomaceæ* for Bentham and Hooker's *Genera*, and drew up a monograph of the order, which appeared in 1871 in the *Transactions of the Linnean Society*. He modified the views of Naudin on this family by uniting the *Mouririæ* with *Memecyleæ* and *Kibessieæ* with *Astronieæ*, and distributed the order into eleven tribes of equal value.

His other important work was *Nouvelles Études sur les Quinquinas*, published in 1870, which was rewarded by the Paris Academy of Sciences, although Triana's attempts to become a member of the Academy were unsuccessful. After this he almost entirely abandoned his botanical studies; and his herbarium suffered deterioration through neglect. The Colombian government being in the hands of those whose political opinions Triana shared, he was appointed Consul-General at Paris for New Grenada. This post he occupied until his death, devoting himself chiefly to commercial and industrial operations, and only occupying himself with science from a practical point of view. He interested himself especially in the Cinchona traffic, notably of the "*quinquina cuprea*,"

produced by certain species of *Remijia*, and also in caoutchouc and the products of certain *Guttiferæ*. The memoir which, with the assistance of Planchon, he published in 1860–2 on the last-named group, grew out of their work on the Colombian Flora. The classification employed was based on the conformation of the embryo; it has since been greatly modified.

[We are indebted for the above information to the kindness of Prof. H. Baillon: a short notice of Triana will also be found in *Nature* for Nov. 27, where his name is uniformly misprinted "Friana."—Ed. Journ. Bot.]

ON THE RUBI OF CAPEL CURIG.

By J. G. Baker, F.R.S.

Last autumn I spent a fortnight at Capel Curig, and made a collection of all the Bramble forms I could find in that part of the valley of the Llugwy and its tributaries. I found ten distinguishable forms, all of which grow in this damp mountain valley at an elevation of 600–800 ft. above sea-level. I sent a set of them to Dr. Focke, and he, with his usual kindness, has examined them and sent me a note of his determinations. I follow the classification adopted in Hooker's *Student's Flora*:—

Subspecies *suberectus*.

1. This is represented by typical *fissus*, which grows plentifully, along with *Myrica Gale*, on the banks of the north branch of the Llugwy, going from Capel Curig in the direction of Llyn Ogwen.

Subspecies *rhamnifolius*.

To this belong five out of the ten forms of the neighbourhood, as follows, *viz.*:—

2. A form differing but little from the ordinary *rhamnifolius* of the London commons. The leaves are more softly hairy beneath, and the rachis of the panicle is more densely pubescent.

3. *R. affinis* Bab., non W. & N. Quite agreeing with the plant so common in Yorkshire and Cheshire, not seen about London. Barren stem very angular, with large hooked prickles. Terminal leaflet orbicular-cuspidate; general and partial petioles armed with copious hooked prickles. Panicle lax, its branches armed with copious large slender yellow prickles. Petals bright pink.

4. A form receding from typical *rhamnifolius* in the direction of *umbrosus* and *mucronatus*. Barren stem subterete; prickles small. Leaflets of barren stem often three only, green and shortly softly hairy below; end-leaflet round oblong, cordate at the base; prickles of petiole few and small. Panicle lax, its rachis bearing many minute setæ intermixed with the small prickles and short pubescence. Sepals ovate, clothed all over with drab tomentum, not lengthened out into a leafy point. I have not seen this form elsewhere, and

Dr. Focke does not identify it with anything that bears a name in Germany.

5. Another form receding from *rhammifolius* in the direction of *umbrosus*, with fully-developed leaves of the barren stem with only three leaflets. Barren stem angled; prickles many, small, rather irregular. Leaves green, with very little hair beneath; end-leaflet cordate-ovate. Panicle-rachis with few prickles, shortly hairy. Petals pinkish. This form also I have not seen elsewhere, and Dr. Focke does not match it with anything that is named in Germany.

5. The most abundant bramble of the neighbourhood is *R. incurvatus* Bab. It grows by the road-side in the village below the church, and plentifully in the quarry just above the Tan-y-bwlch Hotel, and in many other places; the leaves are always softly hairy beneath, and the petals pink. Capel Curig is the place to study *incurvatus* in full perfection.

Subspecies *villicaulis*.

6. This is represented by a robust form with a lax slightly-compound panicle, with a very hairy rachis. Dr. Focke regards it as a form allied to *R. sylvaticus* W. & N., but not typical.

Subspecies *umbrosus*.

7. One of the commonest brambles of the neighbourhood is our ordinary English *umbrosus*, made rather more luxuriant than usual by the damp climate. Dr. Focke now identifies our common English plant with the Scandinavian *R. polyanthemos* of Lindberg and the German *R. pulcherrimus* of Neumann. It is *R. Muasii* of *Lond. Cat.* ed. 8, but I do not think this identification can stand.

Subspecies *Sprengelii*.

8. I saw ordinary typical *Sprengelii* in one place only, by the side of the old road between the Tan-y-bwlch Bridge and the Swallow Fall.

Subspecies *Radula*.

10. This is represented by a plant I had not seen before, which Dr. Focke identifies with *R. macrothyrsos* Lange, in *Flora Danica*, tab. 2832. It has a slightly angled barren stem armed with copious small rather irregular prickles, quinate leaves green and thinly softly hairy below, the end-leaflets cordate-orbicular, with shallow broad serration and a very compound open panicle with copious irregular prickles and strong dense pubescence. It has also been found in the same district by Mr. J. E. Griffith and Mr. Charles Bailey.

I did not see about Capel Curig any *discolor*, *leucostachys*, *cæsius*, *corylifolius*, *Koehleri*, or *horridus*.

I noted a *Koehleri* form (*pallidus* Bab., non W. & N.) at 1000 ft. above sea-level, by the side of the path going up Snowdon from Llanberis.

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ*.

By Edmund G. Baker, F.L.S.

(Continued from Journ. Bot. 1890, p. 371.)

Genus VII. *CALLIRHOË* Nutt. in Journ. Acad. Nat. Sc. Phil. ii. p. 181. — Bracteolæ 0 vel 1–3 distinctæ. Styli intus longitudinaliter stigmatosi. Carpella intus sub rostro transverse appendiculata.

Sect. 1. *Malvoideæ* A. Gray, Pl. Fendl. p. 16.—Bracteolæ 3.

1. C. TRIANGULATA A. Gray, Pl. Fendl. p. 16. *Malva triangulata* Leavenw. in Am. Journ. Sc. vii. p. 62. *M. Houghtonii* Torr. & Gray, Fl. i. p. 225. *Nuttallia cordifolia* Nutt. in Journ. Acad. Nat. Sc. Phil. vii. p. 98. *N. triangulata* Hook. Journ. Bot. i. p. 197. — Hirto-pubescens, radice tuberosa caulibus adscendentibus, foliis triangulatis vel hastatis radicalibus subcordatis crenatis superioribus incisis, bracteolis apice spathulatis calyce subæquantibus, sepalis ovatis, floribus paniculatis rubro-purpureis, carpellis lævibus suborbiculatis.

Hab. United States (Indiana to Minnesota and southwards!).

Stem 2 ft.; leaves, petiole 2–5 in., lamina 2–4 in. long; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{4}$ in.; petals 1 in.

2. C. INVOLUCRATA A. Gray, Pl. Lindh. p. 159. *Nuttalia involucrata* Nutt.; Torrey in Ann. Lyc. N. Y. ii. p. 172. *Malva involucrata* Torr. & Gray, Fl. i. p. 226; Hook. Bot. Mag. t. 4681. *C. verticillata* Grönl. in Revue Hort. 1862, p. 171, and tab.— Hirsuta vel hispida, caulibus decumbentibus, foliis pedato 5–7-partitis segmentis inciso-lobatis, pedunculis axillaribus unifloris folio longioribus, bracteolis lanceolatis calyce dimidio brevioribus, petalis rubris vel purpureis, carpellis rotundatis undique rugoso-reticulatis.

Hab. United States (Minnesota to Texas! and New Mexico!). Mexico!

Stem 1–2 ft.; leaves 1–2 in. long; bracts $\frac{1}{2}$ in.; sepals $\frac{3}{4}$–1 in.; petals 1 in.

Var. LINEARILOBA A. Gray in Proc. Acad. Phil. 1862, p. 161. *Malva involucrata* var. *lineariloba* Torr. & Gray, Fl. i. p. 226. *C. palmata* Buckl. in Proc. Acad. Phil. 1861, p. 449. *Malva lineariloba* Young, Fl. Tex. p. 180.—Segmentis foliorum linearibus.

Hab. Texas! *Drummond, &c.* Mexico! *Berlandier.*

Var. TENUISSIMA Palmer in Herb. Kew. — Caule breve tenue, foliis minoribus majus dissectis segmentis linearibus vel lanceolatis.

Hab. North Mexico. E. of Salt-hills! alt. 10,000 ft., *Dr. E. Palmer.*

Var. NOVO-MEXICANA.—Foliis minus dissectis.

Hab. New Mexico. A few miles west of McNees's Creek! *Fendler.*

Mo. Bot. Garden,

Sect. 2. *Eucallirhoës* A. Gray, Pl. Fendl. p. 17. — Bracteolæ 0 vel in C. Papavere 1–3 sæpeque a flore pl. m. remotum.

3. C. PAPAVER A. Gray, Pl. Fendl. p. 17. *Malva Papaver* Cav.; DC. Prod. i. 431. *M. nuttalloides* Croom, Am. Journ. Sci. xxvi. p. 312. *Nuttallia Papaver* Grah. in Bot. Mag. t. 3287. *N. grandiflora* Paxt. Mag. Bot. v. p. 429, and tab. — Strigoso-hirsutula, caulibus adscendentibus gracillimis, foliis radicalibus subcordatis 3–5-fidis lobis oblongis paucidentalis caulinis digitato-5–3-partitis laciniis lineari-lanceolatis plerumque intergerrimis, petalis violaceo-rubris, carpellis rugoso-reticulatis.

Hab. United States (Texas! and Arkansas! and southwards).

Stems 1 ft.–18 in.; leaves $1\frac{1}{2}$–$3\frac{1}{2}$ in. long; sepals $\frac{1}{3}$–$\frac{1}{2}$ in.; petals $1\frac{1}{2}$ in.

4. C. ALCÆOIDES A. Gray, Pl. Fendl. p. 18. *Sida alcæoides* Michx. Fl. ii. p. 44. *S. macrorhiza* James, Long's Exp. ii. p. 121. *Malva pedata* var. *umbellata* Torr. & Gray, Fl. i. p. 227. *C. macrorhiza* A. Gray, Pl. Fendl. p. 18. — Strigoso-pubescens, caulibus erectis gracilis, foliis radicalibus cordato-triangularibus incisis caulinis 5–7-partitis laciniatis, summis cum segmentis linearibus, floribus corymbosis, petalis albis vel roseis, carpellis dorso rugosissimis.

Hab. United States (Kentucky to Kansas and Nebraska). Oregon!

Stems 1 ft.; leaves 2–3 in.; sepals $\frac{1}{3}$–$\frac{1}{2}$ in.; petals $\frac{1}{2}$–1 in.

5. C. DIGITATA, Nutt. in Journ. Acad. Nat. Sc. Phil. ii. p. 181. *Nuttallia digitata* Barton, Fl. N. Am. ii. p. 74, t. 62; Sims. Bot. Mag. t. 2612. *N. pedata* Barton, Fl. N. Am. ii. p. 74. *N. cordata* Lindl. Bot. Reg. 23, t. 1938. *Malva digitata* Torr. & Gray, Fl. i. p. 227. *M. pedata*, Torr. & Gray, Fl. i. p. 227.—Hirtula vel glabra, caulibus adscendentibus gracillimis, foliis digitato-5–7-partitis caulinis sæpissime cum segmentis linearibus, pedunculis subracemosis longis filiformis, petalis rubro-purpureis vel albis, carpellis rugoso-reticulatis.

Hab. United States (Kansas to Texas! New Mexico).

Stem 1 ft.–18 in. high; leaves $1\frac{1}{2}$–3 in. long; sepals $\frac{1}{2}$ in.; petals 1 in.

6. C. PEDATA A. Gray, Pl. Lindh. p. 160.—Glabra, caulibus erectis, foliis cordato-5–7-partitis segmentis inæqualiter lobatis summis tripartitis segmentis linearibus, pedunculis paniculato-racemosis vel corymbosis, sepalis glabris acuminatissimis, petalis ceraseo-roseis, carpellis lævibus glabris dorso ad originem rostri maximi cristato-3-crenatis e basi subdehiscentibus.

Hab. United States (Texas! Arkansas! New Mexico!).

Stem 3–5 ft.; leaves $1\frac{1}{2}$ in. long; sepals $\frac{1}{3}$ in. to nearly $\frac{1}{2}$ in.; petals $\frac{3}{4}$ in.

Differs from preceding by its smaller flowers, leafy stems, more incised foliage, and slender annual or biennial root.

Var. MINOR A. Gray, Pl. Wright. ii. p. 20. — Floribus parvulis pallidis.

Hab. Along the San Pedro!

Species exclusa.

C. spicata Regel = *Sidalcea spicata* Greene.

Genus VIII. *SIDALCEA*, A. Gray, Pl. Fendl. p. 18. — Bracteolæ 0. Columna staminea duplex exterior 5-adelphia. Styli intus longitudinaliter stigmatosi. Carpella erostria (raro rostrata.)

* *Annuæ.*

*1. SIDALCEA HARTWEGII A. Gray, Pl. Fendl. p. 20; Proc. Am. Acad. xxi. p. 409; Benth. Pl. Hartw. p. 300.
Hab. California!

Var. TENELLA = *S. tenella* Greene, in Bull. Calif. Acad. i. p. 7.
Hab. California!

2. S. HIRSUTA A. Gray, Pl. Wright, i. p. 16; Proc. Am. Acad. xxi. p. 410.
Hab. California!

3. S. CALYCOSA Marcus Jones in Amer. Nat. xvii. p. 875; A. Gray in Proc. Am. Acad. xxi. p. 410. *S. sulcata* Curran *fide* Green in Bull. Calif. Acad. i. p. 79.
Hab. California!

4. S. DIPLOCYPHA A. Gray, Pl. Fendl. p. 19; Proc. Am. Acad. xxi. p. 410. *Sida diplocypha* Torr. & Gray, Fl. N. Amer. 1. p. 234 Hook. & Arn. Bot. Beech. p. 236, t. 76.
Hab. California!

Var. β. MINOR A. Gray, Pl. Fendl. p. 19.
Hab. California!

** *Annuæ vel perennes.*

5. S. VITIFOLIA A. Gray in Proc. Am. Acad. vii. p. 332.
Hab. California! *H. N. Bolander* No. 6473.

6. S. MALACHROIDES A. Gray in Proc. Am. Acad. vii. p. 332.
Hab. California!

These two species are closely related to one another, but quite unlike any other members of the genus.

*** *Perennes.*

† Petalis albis.

7. S. CANDIDA A. Gray, Pl. Fendl. p. 24; Proc. Am. Acad. xxii. p. 286.
Hab. Colorado! New Mexico!

†† Petalis roseis vel purpureis raro albis.

++ *Cinerea.*

8. S. CALIFORNICA A. Gray, Pl. Fendl. p. 19; Proc. Am. Acad. xxii. p. 286. *Sida Californica* Nutt.; Torr. & Gray, Fl. N. Amer. i. p. 233.
Hab. California!

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* When good descriptions are easily accessible they will be omitted in this Synopsis.

+++ +++ *Herbæ virides non cinereæ.*

= Carpella matura siccitate faciebus ruguloso-reticulata.

9. S. MALVÆFLORA A. Gray, Pl. Wright, i. 16, partim; Proc. Am. Acad. xxii. p. 286. *Sida malvæflora* DC. Prod. i. p. 474; Moc. & Sessee, Fl. Mex. t. 70. *Sidalcea humilis* A. Gray, Pl. Fendl. p. 20. *Sida delphinifolia* Nutt.; Torr. & Gray, Fl. N. Amer. i. p. 235. *Sidalcea delphinifolia* A. Gray; Benth. Pl. Hartw. p. 300. *Nuttallia malvæflora* Fisch. & Mey, Ind. Sem. Hort. Petrop. 1837.

Hab. California! Mexico.

Easily distinguished from *S. Oregana* A. Gray by its larger flowers.

10. S. ASPRELLA Greene in Bull. Calif. Acad. i. p. 78; A. Gray in Proc. Am. Acad. xxii. p. 286.

Hab. California.

"Roughish, with minute stellular pubescence, or below glabrous."

11. S. CAMPESTRIS Greene in Bull. Calif. Acad. i. p. 76. *S. Oregana* A. Gray, Pl. Fendl. p. 20, partim. *Sida malvæflora* Lindl. Bot. Reg. t. 1036.

Hab. California, Oregon, Washington Territory.

12. S. OREGANA A. Gray, Pl. Fendl. p. 20, partim; Proc. Am. Acad. xxii. p. 287. *Sida Oregana* Nutt.; Torr. & Gray, Fl. N. Amer. i. p. 234.

Hab. Oregon! Washington Territory, Idaho to British Columbia! and Vancouver's Island!

13. S. GLAUCESCENS Greene in Bull. Calif. Acad. i. p. 77. *S. malvæflora* Watson, Bot. King's Expd. p. 46, partim.

Hab. California, Oregon! Utah.

14. S. HICKMANI Greene, Pittonia, i. p. 139.

Hab. California. Reliz Canon, Monterey Co. *J. B. Hickman.*

= = Carpella matura lævia.

* *Flores racemosi.*

15. S. NEO-MEXICANA A. Gray, Pl. Fendl. p. 23; Proc. Am. Acad. xxii. p. 287. *S. malvæflora* A. Gray, Pl. Wright, p. 20, partim.

Hab. New Mexico! N. Arizona! Colorado! Mexico!

** *Flores dense spicati.*

16. S. SPICATA Greene in Bull. Calif. Acad. i. p. 76. *Callirhoë spicata* Regel, Gartenflora, t. 737.

Hab. California, Oregon.

*** *Flores laxe racemosi.*

17. S. HENDERSONII S. Wats. in Proc. Am. Acad. xxiii. p. 262.

Hab. Oregon, near Clatsop Bay, *L. F. Henderson*,

****** *Flores scaposi.***

18. S. PEDATA A. Gray in Proc. Am. Acad. xxii. p. 288.
Hab. S. California, Bear Valley, *S. B. Parish.*
"The staminal phalanges of this plant are very crowded at the summit, and indistinct."

Non satis notæ.

Sidalcea nodosa Turcz. in Bull. Soc. Mosc. 1863, p. 566.
S. peruviana Turcz. in Bull. Soc. Mosc. 1863, p. 566.
S. triloba Turcz. in Bull. Soc. Mosc. 1863, p. 566.

(To be continued.)

SHORT NOTES.

EXTINCTION OF COTONEASTER VULGARIS.—Prof. Babington sends us the following, which he has received from a correspondent:—"*Cotoneaster vulgaris* is quite extinct at the Orme's Head. I was at Llandudno last year for three weeks. I searched the hill very carefully in the parts where it used to grow, but could find no trace of it left; and I was also told by Jones, the hairdresser there, who is a botanist of many years' experience, that it was quite extinct. Owing a good deal to Bishop Walsham How's exposure in *The Gossiping Guide to Wales* of its presence, value, and almost exact locality on the Orme's Head, many visitors used to ask for it, and Jones told me that the children of the cottagers used to ruthlessly pluck it and offer it to visitors for a few pence each spring. Thus, as in so many other matters, filthy lucre has brought ruin and destruction."

HIERACIUM PROTRACTUM Lindeb. IN BRITAIN.—In 1886 I collected a hawkweed, which was evidently new to Britain, in two places in Shetland, *viz.*, by the Loch of Cliff, Unst (no. 610), and on low cliffs at Mid Yell Voe, Yell (no. 611). Both gatherings were referred to the above species by Mr. Hanbury, whose determination is now fully confirmed by Dr. Lindeberg himself. I now know of the plant in four localities, on three different islands; and it seems to be confined to Shetland, so far as Britain is concerned.—W. H. BEEBY.

A NEW BRITISH MOSS.—Last summer *Cinclidotus riparius* W. Arn. was found by me in the River Teme, near Ludlow, Shropshire, and was put aside at the time with other mosses for future examination. A few days ago I sent it to Mr. W. P. Hamilton, of Shrewsbury, who at once named it *Cinclidotus riparius*, but he thought it best to send it to Dr. Braithwaite, Mr. Boswell, and others, for further identification. They have now confirmed his opinion, and this is the first record therefore for Great Britain, though it was found some two years ago in Ireland by Mr. Stewart. The record is interesting, too, as Wilson says (*Bry. Brit.*, p. 138) in describing the species, with reference more especially to the var. *β. terrestris*, now known as *Barbula mucronata* or *B. Brebissoni*:—"Search has

been repeatedly made, without success, for the aquatic form." Dr. Braithwaite, I believe, intends to describe and figure it, and it is already described by Wilson. I think it will not improbably be found in many collections, mixed with *C. fontinaloides*, to which it bears considerable resemblance until put under the microscope. Although at present a Shropshire record, I hope soon to find it in Herefordshire also, as in its present habitat the county boundary runs down the centre of the river only a few yards away. To Mr. Hamilton, however, belongs the whole credit of this interesting discovery, as, but for his kindness in naming specimens for me, the "find" would probably have been consigned to oblivion.—ARTHUR W. WEYMAN.

NOTICES OF BOOKS.

Lauraceæ americanæ monographice descripsit CAROLUS MEZ, Phil. Dr. 8vo, pp. vi. 556, tt. 3. (Berlin: Borntraeger. 1889).

Voici un livre consciencieusement travaillé, et qui démontre une fois de plus l'inanité des assertions de quelques ennemis de la Science, décorés à tort du tître de botanistes, et d'après laquelle la botanique systématique serait parachevée et "aurait fait son temps." Après les nombreuses études monographiques entreprises dans le courant même de ce siècle, par Nees d'Esenbeck, Meissner, Bentham et Hooker, et quelques-autres, on pouvait supposer la science définitivement fixée sur ce curieux groupe de végétaux. Il n'en était rien ; l'œuvre de M. Mez modifie de nombreux faits admis, rectifie des erreurs, redresse la nomenclature et l'organographie. Elle n'était donc pas inutile, et la science n'était pas suffisamment faite sur ces questions. Qu'on nous permette d'ajouter qu'elle ne c'est même pas encore. L'auteur a pu étudier les plantes de la plupart des grandes herbiers de l'Europe. Il déclare, dès le début de son œuvre, qu'il s'appuiera pour la constitution des sous genres sur la morphologie de l'inflorescence, à l'exemple de Meissner. Celui-ci avait basé les genres sur la forme du périanthe fructifère. M. Mez place bien au dessus de lui Nees d'Esenbeck, qui avait recours à l'étude de l'organisation florale. C'est une affaire d'appréciation. Sans doute le travail de Nees comporte plus d'études attentives de la fleur que celui de Meissner. Mais outre qu'il faut toujours, comme M. Mez le reconnâit lui-même, tenir compte du périanthe fructifère, on ne trouve pas toujours Nees un analyste suffisant quand on le consulte dans des travaux tels que sa monographie des Acanthacées, ensemble souvent confus et renfermant de nombreuses inexactitudes d'observation. M. Mez prévient d'ailleurs le lecteur qu'il a modifié presque toutes les descriptions et les limites des genres, et qu'il a souvent introduit dans ceux-ci des sections jusqu' ici inconnues.

Suit un tableau d'ensemble des genres, qui groupe ceux-ci en deux sous-ordres : les Cassythées et les Laurées. C'est une notion fort anciennement admise. Les Cassythées ne comprennent que

le genre *Cassytha*, et les Laurées américaines renferment vingt-et-un genres. Ceux-ci se groupent en deux sous-tribus : les Perséées, et les Litsæées. Les genres de cette dernière tribu sont au nombre de quatre: *Litsæa*, *Umbellularia*, *Sassafras*, *Benzoin*. Ceux de la tribu des Perséées sont au nombre de dix-sept, que nous allons d'abord passer en revue.

Cryptocarya R. Br.—M. Mez admet neuf espèces américaines de ce genre, dont trois nouvelles, les *C. Aschersoniana*, *saligna*, *minima*, du Brésil. Il continue, et c'est ici qu'il sera utile d'introduire encore des modifications dans la science, de décrire l'ovaire des *Cryptocarya* comme plongé dans le fond du tube du périanthe et le fruit comme entouré d'une périanthe dont l'orifice est fermé. Il n'est guère permis, après les travaux organogéniques de Payer et d'autres, d'admettre que le réceptacle concave des Lauracées n'entre pour rien dans la formation de ces enveloppes qui entourent le fruit sous forme de cupule, ou qui l'enclosent sous forme de sac. Sinon, les *Cryptocarya* ne seraient point périgynes quant à leur androcée, et encore d'une périgynie extrêmement accentuée, comme celle de certaines Rosacées. Il est très-remarquable d'ailleurs que les notions relatives au réceptacle floral n'ont pénétré qu' insuffisamment dans la monde botanique. On ne voit guère dans une fleur que ses verticilles, et c'est à peu près la même chose que de ne considérer dans un axe feuillé que les feuilles, sans tenir compte de la branche qui les supporte. Les verticilles floraux seraient dans le vide s'il n'y avait un axe pour les soutenir, et nous croyons utile, dans toute description florale, de désigner tout d'abord la configuration de cet axe. M. Mez dit du fruit des *Cryptocarya*: "Drupa (v. bacca)." Est-ce donc qu'on rencontre les deux sortes de fruits dans un même genre de Lauraceés? S'il n'y a réellement pas de noyau, il faut vraisemblablement renoncer à la dénomination de drupe.

Hufelandia Nees.—Il y a, d'après l'auteur, sept *Hufelandia* américains, dont un douteux. Dans le *Genera* de Bentham et Hooker, le genre *Hufelandia* avait été supprimé et fondu dans le genre *Beilschmiedia* Nees. M. Mez conserve les deux genres, et il est, là dessus, de notre opinion; car, dans *l'Histoire des plantes*, non seulement nous n'avions pas fondu les deux types, mias encore nous les avions laissés à quelque distance l'un de l'autre, tout en faisant remarquer que les *Beilschmiedia* avaient à peu près la fleur des *Hufelandia*. Il est évident qu'avec les principes admis dans le *Genera* de Bentham et Hooker, on pourrait, dans cette famille, réunir encore bien d'autres types entre eux. Mais il faut, autant que possible, ne pas réunir sans analyses approfondies. Les *H. emarginata*, *curviramea*, *mexicana* sont nouveaux pour la flore américaine; ils avaient été décrits comme *Cryptocarya* ou *Aydendron*.

Bellota Gay.—Ce nom est synonyme de *Boldu* Feuill. Le fait avait été parfaitement établi par Nees, Meissner et nous-même, et M. Mez reconnait que les deux noms sont synonymes. Alors il n'était que juste de préférer le nom de *Boldu* qui est de Feuillée, qui date de 1714, et dont l'extrait de naissance a été, en tout cas, régularisé par Nees en 1833; et non *Bellota* qui a été inspiré á C.

Gay par un personnage haut placé, mais peu soucieux de l'exactitude et dont les erreurs ne se comptent plus. Peut-être M. Mez a-t-il été conduit à ce choix par le désir louable d'éviter toute confusion avec les *Boldo* de la famille des Monimiacées. Mais je crois qu' aujourd'hui cette confusion n'est plus à redouter, *Peumus* étaut bien reconnu de tous les botanistes contemporains. M. Mez a bien vu (p. 29) que l'erreur du *Genera* de Bentham et Hooker vient de ce que les auteurs ont eu sous les yeux des fruits qui n'étaient pas ceux d'un *Boldu*. Nous aurons à revenir sur des faits analagues au sujet du *Gomortega*.

Ajouea Aubl.—On est à peu prés d'accord sur ce genre dont l'auteur décrit 23 espéces, réparties dans trois sous-genres: *Hufelandiopsis*, *Euajouea* et *Erianthera*. Les *A. piauhyensis*, *Severini*, *granatensis*, *tambillensis*, *Zellskii*, *dubia*, sont nouveaux dans la premiére section; dans la deuxième, les *A. Riedelii*, *Gaudichaudii*, *hirtella*, *Burchelliana*, *Warmingii*, *Meissneri*; dans la troisième l'*A. myristicoides* qui la constitue à lui seul. L'*A. Benthamiana* Mez est une espèce anomale, découverte au Brésil par Spruce et qui, dans sa collection, porte le n. 2414, et dont nous verrons peut-être avant peu faire un genre spécial.

Aniba Aubl.—C'est le genre *Aydendron* de Nees et Martins. Convaincu de l'identité des deux types, M. Mez a rendu avec raison justice à notre grand compatriot Aublet, l'auteur de l' *Histoire des plantes de la Guiane francaise*. Meissner avait bien vu (*Gen.* 937) que l'*Aniba* est une Lauracée. Si Bentham n'avait pas négligé, comme il le fit trop souvent, le type dessiné d'Aublet qu'il avait à sa disposition au British Museum, il y a longtemps que la rectification eût pu être faite. M. Mez décrit vingt-huit espèces de ce genre: il y en a six absolument nouvelles, sans parler de celles qui avaient été étudiées sous le nom d'*Aydendron*. Il rapporte notamment à ce genre un arbre assez mal connu jusqu' ici et qu'on atribuait généralement aux genres *Nectandra* et *Ocotea*: c'est l'*A.* (?) *Puchury-major*, qui jouit de quelque notoriété comme fournissant à la thérapeutique des cotylédons désignés dans la pratique sous le nom de *Petites-Féves-Pichury*.

Systemonodaphne Mez.—C'est un genre nouveau, monotype, fondé sur le *Gœppertia geminiflora* de Meissner, arbre de la Guiane française, qui a le réceptacle floral plus court que le périanthe, trois verticilles d'étamines fertiles, chargées de poils; celles du troisième verticille monadelphes. Le fruit repose sur une cupule bimarginée, dont la levrè extérieure supporte les restes du périanthe.

Urbanodendron Mez.—C'est encore un genre nouveau, fondé sur l'*Aydendron verrucosum* de Nees, qui est brésilien et se trouve dans la province de Rio de Janeiro. On n'aime pas, en général, les noms génériques constitués de la sorte, et je dois avouer que *Baillonodendron* m'a récemment fait sourire. Le plus singulier caractère de ce type, c'est la présence de dix-huit grandes glandes florales, qui ne se retrouvent nulle part ailleurs parmi les Lauracées à anthéres bilocellées.

Acrodiclidium Nees.—Avec sa caractéristique première, ce genre se divise en deux sous-genres, dont l'un est l'*Evonymodaphne* de

Nees, qu'on préférait jadis joindre aux *Ocotea*, et l'autre l' *Euacrodiclidium* Mez. Les espèces s'élèvent par là au nombre de dix-neuf, dont très-peu sont nouvelles, comme les *A. foveolatum*, *Martinianum* et *debile*. La plupart des autres avaient été décrites comme *Aydendron*, etc. C'est à ce genre que M. Mez rapporte l'arbre à la Grande Fève-Pichurim, *Ocotea Puchury major* Mart.

Misanteca Cham. et Schlchtl.—Ce genre, jadis monotype, comprend actuellement trois espèces. Outre le *M. capitata*, on y compte un *M. Jürgensensii* Mez, qui est le *Nectandra limbata* Meissn. (non Nees), de Mexique ; et le *M. triandra*, qui est la plante bien connu des Antilles, l'ancien *Laurus triandra* de Swartz et l'*Endiandra jamaicensis* de Sprengel, nommé successivement par Ach. Richard *Misanteca cubensis*, *Aydendron cubense*, et *Symphytodaphne cubensis*.

Silvia Fr. Allem.—Nous avions conservé ce genre comme distinct de l'*Endiandra*. Bentham n'avait pas été de cet avis. Mais M. Mez y revient, non sans raison, et il insiste sur les motifs qui lui font rejéter la réunion des deux types. C'est Meissner qui s'est le premier trompé sur les caractères du genre *Endiandra*, et Bentham ne l'aurait pas suivi s'il avait analysé les fleurs de ces genres. Pour M. Mez, le *Silvia* est un genre qui relie les *Misanteca* aux *Acrodiclidium*. En somme, l'*Endiandra* de Bentham n'est pas celui de R. Brown. Il y a six espèces dont aucune n'est absolument nouvelle ; mais la plupart avaient été jusqu'ici rapportées aux *Oreodaphne*, *Acrodiclidium*, et *Oreodaphne*.

Endlicheria Nees.—C'est le genre *Gæppertia* de Nees, auquel *Endlicheria* est préféré ; ce dernier date de 1833, et il avait été abandonné parceque Presl avait en 1832 établi un autre *Endlicheria*, de la famille des Rubiacées. Mais aujourd'hui le nom de Presl est lui-même délaissé comme synonyme d'*Emmeorhiza*, et le nom d'*Endlicheria* reparaît parmi les Lauracées. Il y aura là peut-être une cause de confusion pour certains botanistes. Le genre ne comprend pas moins de vingt-deux espèces réparties dans cinq sous-genres.

Persea Gærtn.—Dans ce grand genre, l'auteur admet quatre sous-genres : *Hemipersea*, *Hexanthera*, *Heterandra* et *Eupersea*, avec quarante-sept espèces américaines. Les espèces nouvelles sont les *P. stricta*, *Urbaniana*, *glaberrima*, *floccosa*, *nivea*, *lanceolata*, *vestita*, *corymbosa*, *grandis*, *Zenmani*, *Liebmanni*, *Chamissonis*, *Krugii*. Les *P. Schiedeana* Nees, et *drimyfolia* Cham. et Schlchtl. sont considérés comme de simples variétés du *P. gratissima* Gærtn. Le *P. lanceolata* Mez est le variété *lanceolata* du *P. splendens* Meissn. Le *P. ferruginea* Mez est le *Laurus ferruginea* de Ruiz et Pavon. Le *P. Humboldtii* Mez est le *P. ferruginea* de Kunth. Le *P. lanata* Mez est la variété α du *P. fuliginosa* Nees. Le *P. cordata* Mez est le *Laurus cordata* du *Flora fluminensis*, le *Canella-rosa* des Brésiliens. Le *P. cærulea* Mez est le *Laurus cærulea* R. et Pav. Le *P. racemosa* Mez est le *Menestrata racemosa* du *Flora fluminensis*. Le *P. hypoleuca* Mez est le *Phœbe hypoleuca* A. Rich., des Antilles. On voit qu'ici M. Mez est le plus souvent fidèle, quant à la nomenclature, à l'ordre historique, le seul qui puisse nous préserver des fantaisies individuelles et qui rend inutiles les prétendues lois de la nomen-

clature botanique, violées, comme on sait, par ceux-là mêmes qui les ont promulguées.

Phœbe Nees.—Nous avions conservé le genre *Phœbe* de Nees d' Esenbeck, en le plaçant près des *Cinnamomum*. Bentham l'avait simplement englobé dans les *Persea*. Il en est repris par M. Mez qui dit avec raison que si l'on supprime le *Phœbe*, c'est bien plutôt à l'*Ocotea* qu'on devrait l'allier. Le genre est riche en espèces américaines, distribuées dans les deux sous-genres *Heteranthera* et *Euphœbe*. Il y en a ici quarante-cinq espèces, dont sept seulement sont absolument nouvelles, les *P. Haussknechtii*, *Bourgeauviana*, *purpurea*, *brasiliensis*, *Ehrenbergii*, *Barbeyana* et *pallescens*. Les autres avaient été décrites comme *Oreodaphne*, *Persea*, *Phœbe*, *Mespilodaphne*, etc.

Ocotea Aubl.—C'est de beaucoup le genre le plus riche en espèces américaines, puis qu'il en renferme deux-cents. Comme c'est au même temps le genre *Licaria* d'Aublet, c'est vraisemblablement ce dernier nom qui devrait être adopté. M. Mez y fait entrer les *Mespilodaphne*, *Petalenthera*, *Uleaindra*, *Leptodaphne*, *Camphoromoea*, *Gymnobalanus*, *Strychnodaphne*, *Nemodaphne* de Nees, et même le *Sassafridium* de Meissner. Nous ne savons jusqu'a quel point les botanistes adopteront cette manière de voir. Il y aura peut-être des protestations. En somme, il n'y a pas grand inconvénient à ce qu'un *Mespilodaphne* appartienne plutôt à un sous-genre d' *Ocotea* qu'a un genre voisin des *Ocotea*, et de même pour les autres sous.genres. Mais il y a certainement des gens qui jugeront digné de réclamer, surtout parmi ceux qui n'ont jamais étudié les Lauracées.

Nectandra Rottb.—C'est encore là un genre très-riche en espèces américaines, puisque nous en comptons quatrevingt-trois. Parmi elles se trouvent le *N. Pichurim* Mez, distinct des Lauracées qui donnent la Petite et la Grande Fêve Pichurim, et dont il a été question plus tant. C'est l'*Ocotea Pichurim* H. B. K. et le *Nectandra cuspidata* de Nees. On n'avait jusqu'ici décrit sous un autre nom les *N. Dominicana*, *anomala*, *velutina*, *Glaziovii*, *Sintenisii*, *Zelskii*, *Brittonii*, *impressa*, *panamensis*, *elongata*, *Pearcei*, *debilis*, *lævis*, *surinamensis*, *nitida*. D'autres avaient paru comme *Nectandra* sous des noms spécifiques que M. Mez rectifie. Le célèbre *N. Rodiæi* Schomb., dont les médecins ont tant parlé, est devenu l'*Ocotea Rodiæi* Mez.

Pleurothyrium Nees.—Ce genre à part, assez mal connu jusqu'ici, figure avec cinq espèces, toutes de Nees d' Esenbeck, sauf le *P. panurense* Mez, qui est le *Nectandra panurensis* Meissn., récolté par Spruce sur le Rio-Uaupès.

Dicypellium Nees.—Une seule espèce représente toujours ce genre, le *D. caryophyllatum* Nees, le *Casca preciosa* des Brésiliens, et, d'après Martius, le *Cravo de Maranhao* et l'*Tbyra Giynka*, notre Cannelle Giroflée.

Litsæa Lamk.—Il y en a six espèces en Amérique, et le genre comprend pour M. Mez, à la fois les *Tetranthera*, *Glabraria*, *Berrya*, *Conodaphne*, *Tetradenia*, *Cylicodaphne*, *Lepidadenia*, *Tomex*, *Heyanthus* et *Sebifera*.

Umbellularia Nutt.—Une seule espèce, l'*U. californica* Nutt., c'est-à-dire le *Tetranthera californica* Hook. et Arn. L'*U. parvifolia* Hemsl. est ramené aux *Litsea*.

Sassafras Nees.—Le seul *S. officinale* Nees.

Benzoin Nees.—Deux espèces seulement, de l'Amérique du Nord, les *B. odoriferum* Nees et *melissifolium* Nees.

Cassytha L.—Une seule espèce, le *C. americana* Nees.

L'énumération de M. Mez se termine par un appendice relatif à "une espèce de l'Ordre des Monimiacées, très-affine aux Lauracées, et qui n'est pas encore assez complètement décrite." Il s'agit du *Gomortega nitida* de Ruiz et Pavon, qui est l' *Adenostemum nitidum* Pers. Ici nous avons un regret à exprimer, c'est que la bibliographie soit si incomplète et qu'à l'heure qu'il est, on puisse encore écrire que le *Gomortega nitida* n'est ni bien connu, ni bien décrit. En fait de caractères extérieurs, la description de *Flora chilena* de Cl. Gay (V. 303) et la planche de Riocreux (t. 60) nous paraîssent tout-à-fait suffisantes. Nous ne parlons pas, dans cette planche, des analyses de Decaisne qui sont certainement défectueuses. Mais pour les caractères de la fleur et du fruit, M. Mez pouvait peut-être se reporter à l'analyse de l'*Adansonia* (IX. 118) et à celle de l'*Histoire des plantes* (II. 323) qu'il ne connaît peut être pas, pas plus qu'il ne paraît savoir quel est l'auteur qui a eu l'idée de placer les *Gomortega* parmi les Monimiacées. Cette notion date cependant de plus de vingt ans. Il est à craindre que M. Mez s'en soit trop rapporté à l'opinion de Bentham, qui, en 1880, considérait le genre *Gomortega* comme des plus douteux et décrit d'un façon variable. L' échantillon qu'il avait sous les yeux dans l'herbier de Kew appartenait cependant très à la plante décrite par Cl. Gay, et l'on ne comprend pas qu'il ait eu l'idée de faire du *Gomortega* une Euphorbiacée (Gen. III. 190) et de ne point songer à contrôler ce que nous avions dit de cette plante et à quoi nous n'avons, à l'heure présente, pas un seul mot à changer. Il ne s'agit pas ici, bien entendu, d'une puérile question de priorité ; mais nous aurions voulu voir l'auteur des Lauracées américaines s'occuper des rapports qu'il y a entre ces plantes et les Monimiacées et discuter même, s'il y avait lieu, l'opinion par nous plusieurs fois émise, que, par leur morphologie, comme par leurs caractères histologiques, les Monimiacées sont d'unmême groupe naturel que les Lauracéés et en représentent seulement la forme pluricarpellée; opinion dont on peut déjà prévoir toutes les conséquences.

Le travail se termine par un essai sur la morphologie et la biologie des Lauracées amèricaines, et par deux planches lithographiées de diagrammes floraux et de fleurs entières. Des analyses de fleurs eûssent été d'une grande utilité dans cette circonstance.

H. Baillon.

British Ferns and where found. By E. J. Lowe, F.R.S. ("Young Collector Series"). Swan Sonnenschein & Co., Paternoster Square. 8vo, pp. 167, 46 cuts. 1s.

The "Young Collector Series" originally consisted of penny pamphlets, intended, as the title denotes, to help collectors. In

this form it supplied a want; many of the little books were as excellent as they were cheap, and they were largely circulated by teachers, amateur and otherwise, among their students. Their place has now been taken by a series of shilling manuals, some good enough, others the reverse, but none so useless to the "young collector" as the one now before us.

As a collection of the names which have been given to the endless forms of our common ferns, Mr. Lowe's book may be of interest. It also makes clear the impossibility of finding the minutest shred of character by which these forms are distinguished from one another; for if Mr. Lowe cannot supply such characters, it is certain that no one else can. But name after name is given—and *such* names!—without any attempt at description. Thus, in a section of *Scolopendrium*, we have such entries as :—

"1. *Baxteri*, Moore. A copy of *Coolingii*."
"4. *constellatum*, Lowe. Raised by Mr. Glave, of Scarborough."
"6. *coronans*, Moule. Unknown to me."
"8. *Cousensii*, Jones. I have never seen this."

There are 437 named varieties of *Scolopendrium vulgare*, some with synonyms; thus:—"*O'Kellyi*, Lowe (*lutescens O'Kelly*, Jones)"; "*Grantæ* Lowe (*crispum variegatum Grant*, Jones)."

The descriptions of the species are so brief as to be useless to the "young collector," who, we trust, will not waste his shilling on this last and worst of popular fern-books, especially as he can obtain for the same sum Mr. Thomas Moore's admirable and well-illustrated little volume on the same subject.

ARTICLES IN JOURNALS.

Annals of Botany (dated Dec. 1890; issued Jan. 1891). — J. R. Vaizey, 'Morphology of Sporophyte of *Splachnum luteum*' (2 plates). —E. R. Saunders, 'Structure and function of septal glands in *Kniphofia*' (1 plate).—A. Barclay, 'Life-history of *Puccinia Geranii-sylvatica* var. *himalensis*' (1 plate).—J. B. Farmer, '*Isoetes lacustris*' (2 plates). — E. M. Holmes & E. A. L. Batters, 'Revised list of British Marine Algæ.'

Bot. Centralblatt (Nos. 1–3).—M. Leonhard, 'Zur Anatomie der Apocynaceen.'

Botanical Gazette (Dec.).—G. A. Rex, 'Development of *Tubulina cylindrica* and allied Myxomycetes.'—B. D. Halsted, '*Peronosporeæ* for 1890.'—E. J. Hill, 'Flora of Lake Superior Region.'—C. Macmillan, 'Phanerogams of Central Minnesota.'

Bot. Zeitung (Dec. 5–26). — H. Solms-Laubach, 'Ueber die Fructification von *Bennettites Gibsonianus*' (2 plates). — (Dec. 26). M. W. Beyerinck, 'Künstliche Infection von *Vicia Faba* mit *Bacillus radicicola*.'—(Jan. 2–23). F. Kienitz-Gerloff, 'Die Protoplasmarerbindungen zwischen benachbarten Gewebselementen in der Pflanze.'

Bulletin de la Société Linnéenne de Paris (Séances du 3 & 17 Dec.). —H. Baillon, 'Sapotacées de la Nouvelle Calédonie' (*Achradotypus*, gen. nov.).

Bull. Torrey Bot. Club (Dec. 9). — G. J. Peirce, '*Corticium Oakesii* and *Michenera Artocreas*' (1 plate).— N. L. Britton, *Ranunculus Porteri*, *Lotus Helleri*, *Spiræa virginiana*, *Cyperus Blodgettii*, spp. nn.—C. A. Davis, 'Pinnatifid leaves of *Nasturtium Armoracia*.'

Gardeners' Chronicle (Jan. 10). — 'Bud Variations or Sports' (figs. 11–23). — (Jan. 17). M. C. Cooke, '*Glœosporium pestiferum* C. & M.'—(Jan. 24). *Cyrtanthus parviflorus* Baker, n. sp.

Journal de Botanique (Dec. 16). — P. Van Tieghem, 'Péricycle et peridesme.' — L. Guignard, 'Recherches sur la localisation des principes actifs des Crucifères.' — (Jan. 1). A. Franchet, '*Carex evoluta* aux environs de Paris.'—E. Belzung, 'Le développement de l'amidon.'—F. Gay, 'Morphologie des *Cladophora*.'

Naturalist (Jan.). — C. P. Hobkirk & W. Hodgson, 'Disappearance of Plants in Yorkshire and Cumberland.'

Nature Notes (Jan. 15). — G. Henslow, 'New Theory of Floral Structure.'—T. D. A. Cockerell, 'Effect of altitude on Plants.'

Nuovo Giorn. Bot. Ital. (Jan. 8).—L. Micheletti, 'Contribuzione alla Flora Umbra.'—E. Gelmi, 'Crittogame vascolari del Trentino.' —L. Buscalioni, 'Granuli d'amido del mais.'—P. Baccarini, 'Flora Irpina.' — C. Massalongo, 'Acarviedidü nella flora Veronese.'— J. Mueller, 'Lichenes Miyoshiani.' — G. Arcangeli, 'Sulle piante-bussola.' — L. Macchiatti, 'Morfologia ed anatomia del seme della *Vicia narbonensis*.' — G. Bresadola, *Stereum insignæ*, *Odontia livida*, spp. nn. — O. Mattirolo & L. Buscalioni, 'Il tegumento seminale delle papilionaceæ nel meccanismo della respirazione.'— C. Massalongo, 'Sull' alterazione di colore dei fiori dell' *Amarantes retroflexus* infetti dalle oospore di *Cystopus Bliti*.' — Id., 'Intorno ulla *Taphrina campestris*.' — Id., 'Cenno intorno ai fiori doppi di *Dahlia variabilis*.' — P. Voglino, 'Casi teratologici di *Agaricini*.' — L. Macchiati, 'Flora del Gerro.' — Id., 'Diatomacee del laghetto artificiale del pubblico giardino di Modena.' — F. Pasquale, 'Sul legname di pioppo attaccato da microrganismi.' — L. Morenos, 'Sulle anomalie fiorali.'—U. Martelli, 'Sull' origine delle Lonicere italiane.'—A. Bertoloni, 'Sulle collezioni botaniche e i manoscritti dal C. P. Bubani.' — F. Pasquale, 'Sulla varietà *pompeiana* del *Laurus nobilis*.'—G. Cicioni, 'Sull' *Erythræa albiflora*.'

Oesterr. Bot. Zeitschrift (Jan.).—M. Willkomm, 'Neue & kritische Pflanzen der spanisch-portugiesischen & balearischen Flora.' — E. Hackel, 'Descriptiones Graminum novorum' (*Coix lingulata*, *Saccharum Ridleyi*, *Erianthus chrysothrix*, *Pollinia Ridleyi*, *Apocopis vaginatus*, *Rottboellia Clarkei*, spp. nn.). — J. Freyn, 'Plantæ novæ orientales' (*Onobrychis Bornmulleri*, *Bunium fallax*, *Achillea intermedia*, *Echinops heterocephalus*, *Hieracium aureo-purpureum*, spp. nn.). E. v. Halácsy, *Rubus pauciflorus*, sp. n.

Scottish Naturalist (Jan.). — W. H. Beeby, 'Flora of Shetland.' —J. W. H. Trail, 'Report for 1890 on Fungi of E. Scotland.'

BOOK-NOTES, NEWS, &c.

The *Icones Plantarum* is now "edited for the Bentham Trustees" by Prof. Oliver, and is in some way (we are not told how) "under the authority of the Director of the Royal Botanic Gardens, Kew." The last number (December, 1890), and the volume of which it forms a part, "is devoted to Indian *Orchidaceæ*," and is entirely from the pen of Sir Joseph Hooker: it thus forms a valuable companion to the monograph of Indian *Orchidaceæ*, which Sir Joseph has just completed in the *Flora of British India*. It was presumably unavoidable, but is certainly inconvenient, that this monograph should be divided between two volumes of the *Flora*. It is strange that so awkward a sentence as "Referred by Reichenbach (in Trans. Linn. Soc.) to *B. triste* of R. f. in Walp. Ann. vi. 253, *and of which* there is a specimen in Herb. Lindl." should have passed the author, the editor, and the director; one of them, we think, might have supplied the reference to "Trans. Linn. Soc.," which is not given in the *Flora of British India:* we regret also that three men of such eminence should have introduced a new and insufficient abbreviation—"R. f."

The part (vol. x., part ii.) of the *Icones* issued last September is of more general interest. It is mainly devoted to Dr. Henry's interesting Chinese novelties, among which Prof. Oliver finds the following new genera:—*Tapiscia* (Sapindaceæ), and *Eucommia* ("genus anomalum, incertæ sedis"). Mr. Bolus describes a few South African plants, including two new genera—*Dermatobotrys* (Scrophularineæ) and *Tysonia* (Borragineæ).

A letter from Mr. H. N. Ridley contains an interesting account of his work at Singapore. Besides papers in local journals, a monograph of Malayan Orchids, a Dictionary of Malay Plant-names, and other works in preparation, he is planning an excursion to "the Big Mountain," to start in March, and has re-arranged a large part of the Herbarium. Mr. Ridley is also Secretary to the local Committee of the Imperial Institute, and is hoping shortly to establish a Museum in Singapore.

Dr. Trimen is hoping to visit Singapore in February, and will proceed thence to Buitenzorg. He has made several additions to the Ceylon flora, which we hope to publish towards the end of the year.

Dr. G. E. Post is making rapid progress with his Flora of Palestine. The work is printed as far as the end of *Umbelliferæ*, and the author hopes to complete it in the course of the next two years. Dr. Post has just published (Lausanne, Bridel) an 8vo pamphlet of 14 pages, entitled *Plantæ Postianæ*, which contains a list of the plants collected by him in Hermon in 1890, among which are the following new species:—*Sisymbrium grandiflorum*, *Astragalus Palmyrensis*, *A. Shepardi*, *A. Mitchellii*, *Cerasus Antilibani*, *Muscari albicaule*.

We understand that the forthcoming number of the *Annals of Botany* will witness a new departure. Considerable prominence will be given to systematic work, and in other ways the *Annals* will approach somewhat closely the lines on which the Journal of Botany is conducted. It is to be hoped that greater punctuality and promptitude in publication may be looked for, and that the promises made by the editors may receive somewhat speedier fulfilment. There is certainly need for improvement in these directions: a recent issue, for example, contained a paper read by Mr. J. R. Vaizey at the meeting of the British Association in 1887; and the bibliography for 1889, which was to have been issued "early in 1890," has not yet appeared. In the number just issued, Mr. Dyer's name is added to the list of editors, and Messrs. Holmes and Batters give an enumeration of the British Marine Algæ, which we propose to notice next month. As the editors refer to "the increasing number of valuable original memoirs sent in for publication," it is to be regretted that their space should be occupied by a local list such as this, which would have found a more fitting place in our own pages—long recognised as the medium for communications referring to British Botany. The number, although dated "December, 1890," did not appear until January.

The *Archives des Sciences physiques et naturelles de la Société helvetique* publishes in its part for November last short diagnoses of the new species of *Malphigiaceæ* collected by Balansa in Paraguay. These are from the pen of M. Chodat, who has prepared a revision of the group for M. Micheli's *Contributions à la flore du Paraguay*.

The *Gardeners' Chronicle* has completed its fiftieth year, and the number for Jan. 3 is mainly devoted to reflections, reminiscences, and retrospections appropriate to this event.

The *Botanical Magazine* for January is mainly devoted to an account by Sir Joseph Hooker of *Amorphophallus Titanum*—the gigantic aroid which created so much excitement when it flowered at Kew in 1889. The description is illustrated by three plates by Miss Smith, "who," says Mr. Watson (who has contributed an interesting account of the growth of the plant), "in her efforts to do justice by her pencil to" this plant and *Bulbophyllum Beccarii*, "suffered in each case a prolonged martyrdom that terminated in illness in the case of the orchid." We congratulate Miss Smith on having escaped the fatal termination which usually succeeds "a prolonged martyrdom."

The post in the Kew Herbarium vacated by Mr. Hemsley on his promotion has been filled by the appointment of Dr. Otto Stapf, of Vienna. Dr. Stapf will, we have no doubt, prove a valuable addition to the Kew staff, but we may be pardoned for regretting that no English botanist could be found for the position.

M. A. Franchet publishes the first part of a Monograph of *Chrysosplenium* in the *Nouvelles Archives* (3rd Series, vol. ii. pt. 1). The genus comprises fifty-four species, of which those of the *Alternifolia* section, nineteen in number, are described in this

portion of the monograph. There are many new species, and the monograph is illustrated by four beautifully executed plates.

The fourth number of the *Papers and Proceedings of the Hampshire Field Club* contains a list of the rarer plants of the Test Valley, by Mr. E. Buckell, and a note on Hampshire Mosses, by the Rev. E. D. Heathcote.

A fund is being raised for the purpose of erecting a suitable memorial of the late John Ralfs in Penzance Cemetery. Mr. W. Bolitho, jun., Penzance, will receive subscriptions.

Dr. B. Carrington and Mr. W. H. Pearson have issued their fourth and last fascicle of *Hepaticæ Britannicæ Exsiccatæ*, containing seventy-five specimens (Nos. 216–290). Of these, sixty-two are British, eleven Norwegian, and two Canadian. Twelve species are represented in duplicate, and two in triplicate: in one of the latter cases—*Cephalozia Lammersiana*—we have three specimens, which illustrate the difference of condition in a plant growing in a single locality. The price is £1 10s.; to subscribers, £1 1s.

Mr. Britten has withdrawn from the editorship of *Nature Notes*, which is now under the sole control of the Rev. Percy W. Myles.

Dr. Thomas Morong has been appointed Curator of the Columbia College Herbarium.

The Herbarium of the British Museum has received a valuable addition of 356 specimens of Canadian Hepatics, collected by Prof. Macoun, and named by Mr. W. H. Pearson. They represent upwards of 150 species, and are the types examined by Mr. Pearson when drawing up his *List of Canadian Hepaticæ* (Montreal, 1890), one of the official publications of the Geological and Natural History Survey of Canada. Three of the species are new—*Frullania Selwyniana* Pears., *Lejeunea Biddlecomiæ* Aust., and *Cephalozia minima* Aust.: the two latter are MS. names of the late C. F. Austin, of whose herbarium Mr. Pearson is the possessor.

We have to thank our Indian correspondent, Mr. C. W. Hope, for a copy of the elaborate *Catalogue of Ferns in the Herbarium of the Government of India at Saharunpur*. It consists of 104 oblong folio pages, the collector, date, and locality of each specimen in the Herbarium being recorded. The compilation was undertaken by Mr. E. W. Trotter, and the determination of the specimens by Mr. C. W. Hope, who hopes ere long to compile an annotated list which will contain some original work.

We learn with great regret that our valued contributor, Mr. T. R. Archer Briggs, succumbed on the 23rd ult. to an attack of inflammation of the lungs, produced by the severe cold. We hope to publish an account of Mr. Briggs's life and works, from the pen of his friend, the Rev. W. Moyle Rogers, in an early number.

Reviews of Miss Woolward's *Masdevallia*, Dr. Richter's *Enumeratio Plantæ Europeæ*, Prof. Baillon's *Herborisations Parisiennes*, and other books, as well as many original communications, are unavoidably held over for want of space.

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BRITISH MUSEUM (NATURAL HISTORY), SOUTH KENSINGTON.

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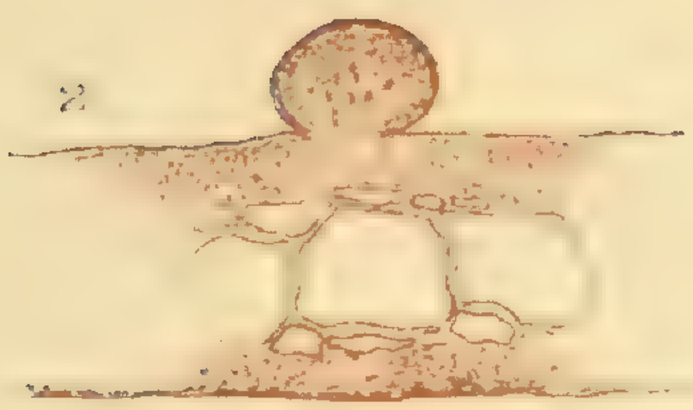
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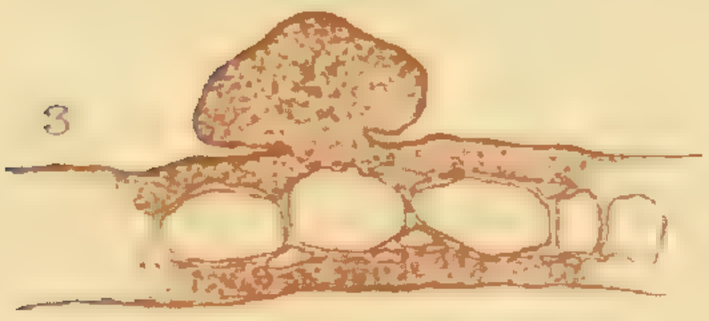
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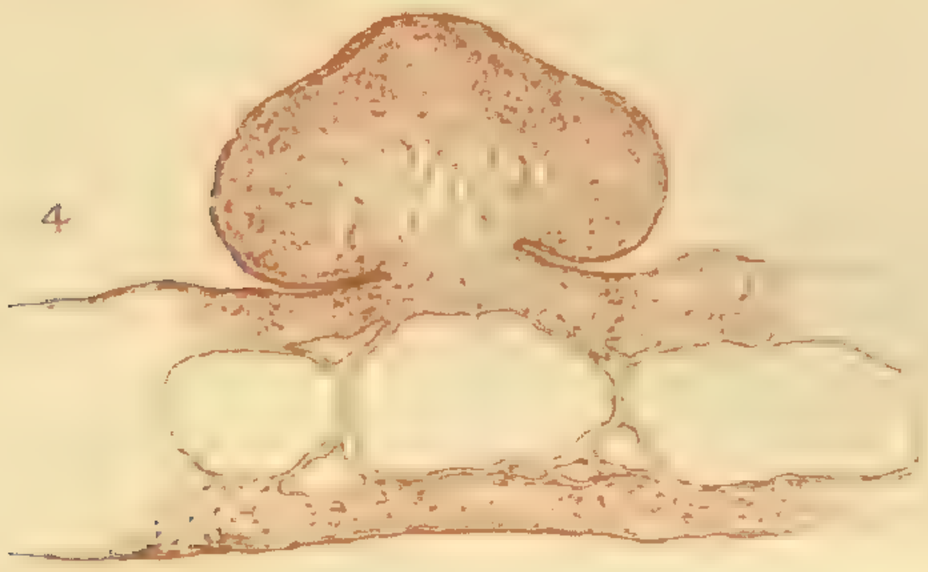
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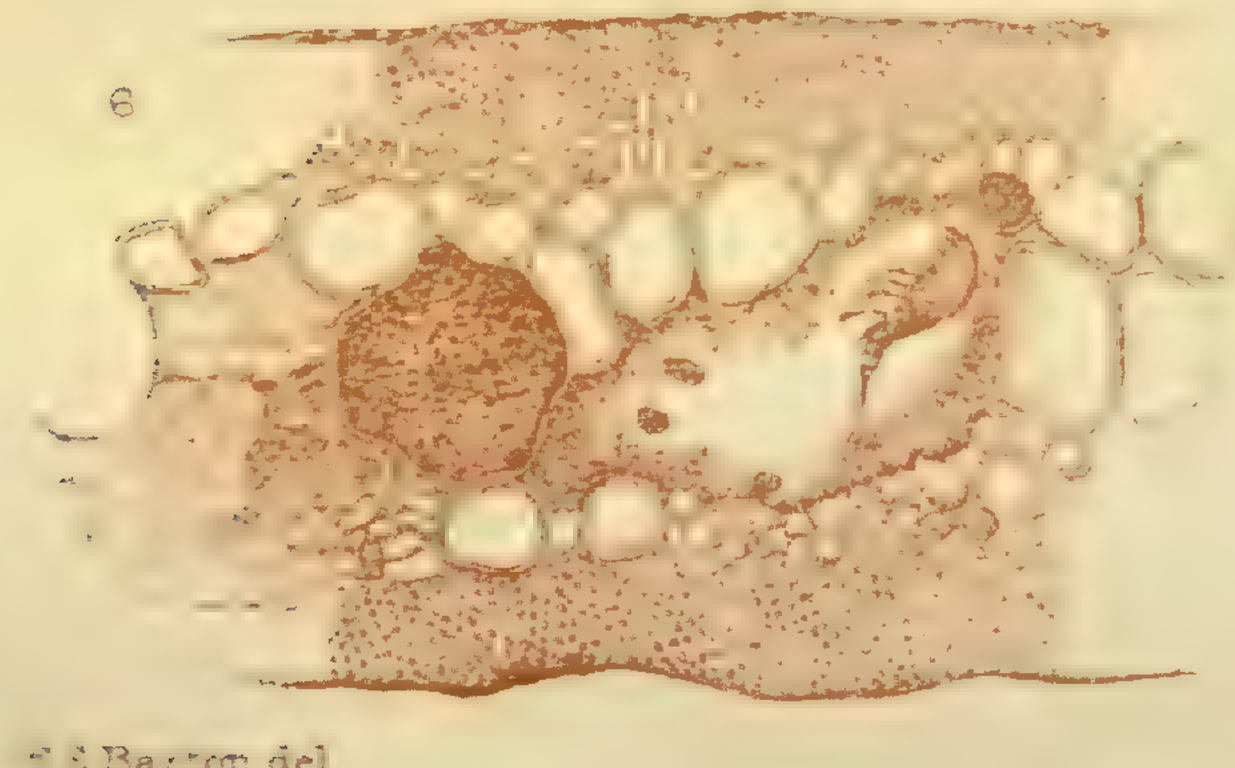
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Galls on Rhodymenia palmata Grev.

ON THE OCCURRENCE OF GALLS IN *RHODYMENIA PALMATA* Grev.

By Ethel Sarel Barton.

(Plate 303.)

So little is known of pathological structures in Algæ, especially the marine forms, that I venture to think some interest will be attached to an account of observations on gall-like structures in the well-known seaweed *Rhodymenia palmata* Grev., or "dulse" as it is popularly called. It has been recorded by Magnus (*Commission zur wissensch. Unters. d. deutschen Meeres*, vol. 2, p. 76), that species of *Chytridiaceæ* cause malformations in certain Algæ, *e. g.*, *Chytridium tumefaciens* Magn., in species of *Ceramium*; *C. sphacellarum* Kny, in *Cladostephus spongiosus* and *Sphacelaria cirrhosa*; and *C. Plumulæ* Cohn, in *Callithamnion*; and to come to animal agency, the so-called "*Vaucheria*-galls" may be cited. These were described and figured by Vaucher (*Conferves d'eau douce*, t. iii. fig. 8), so long ago as 1803, and numerous observers have since his time added to our knowledge, or at all events to the literature, of the subject, notably Balbiani, who has given a beautifully illustrated account of them in the *Annales des Sciences Naturelles* (Zoologie), 6 sér. tom. vii. 1878. It may be mentioned that Mr. A. W. Bennett, in a short paper on this subject (*Annals of Botany*, vol. iv. pp. 172, 300), quotes the literature and furnishes us with fresh observations. He agrees with Balbiani "that 'the gall' is a lateral fertile branch which the parasite has entered at an early stage, prevented it from forming oogones and antherids, and caused it to swell to from four to five times its original size by hypertrophy, brought about probably by the action of a stimulating secretion, as in true galls."

With the exception of the above cases I know of no other malformation in Algæ except a state of *Ascophyllum nodosum* shown me by Mr. George Murray, of which I hope to be able to give an account at another time.

Whether the formations I am going to describe are to be correctly termed "galls" I may not definitely say, but they are certainly outgrowths of tissue produced by the presence and operations of an animal body, or it may be by the stimulation of a specific animal secretion.

In ignorance of a better word, if there be one, I shall call them galls, and at least they have a better claim to the title than the malformation so-called in *Vaucheria*.

While working at Stonehaven last August, Mr. George Murray and I collected several *Rhodymenia* plants, on which numerous minute papillæ were observed. These were in all cases on mature plants, and, with the object of perhaps determining their nature, I made a number of examinations of them. They certainly at first baffled my curiosity in this respect, and though Dr. Scott at this stage of my work suggested (as the result of his

own earlier investigation of such bodies at Penzance) that they were possibly of the nature of galls, I was yet left without a clue to their origin, or even a conjecture as to their development. The surface of the affected parts of the frond is covered with minute papillæ, and seen in section these papillæ appear to be composed of precisely similar structure to the thallus. The normal cortical cells of the *Rhodymenia* frond are continuous with those of the papilla, and the larger medullary cells of the frond are also continuous with those in the outgrowth. The actual epidermal layer of the gall possesses thicker walls than the corresponding layer of the thallus. The central cells of the papilla, however, have often thick or discoloured contents. The matter remained at this stage until Mr. Murray collected several specimens, which he brought to me, showing a further development of the galls. These were in fact a series of intermediate stages between those papillæ and definite proliferous outgrowths sprouting from the flat surface of the frond, and exactly resembling in shape and structure the well-known marginal* proliferations characteristic of *Rhodymenia palmata*, though never attaining the same dimensions. These proliferations, sprouting from the surface, possibly become detached at a later stage, since small pits, and even holes, occur on the frond in their neighbourhood. However, this is merely conjecture, since the holes and pits may be accounted for by the ravages of the animal I am about to describe.

The matter remained in this position until I was able to resume its investigation in the British Museum on the preserved material. It was then found that in the region of the papillæ there were numerous lesions in the tissue of the thallus; whole tracks of medullary tissue were destroyed, and the cells bounding such tracks possessed thickened walls, produced by some reparative process (fig. 6). In these diseased portions, and in the neighbouring cells and intercellular spaces, there were found plentifully round bodies of animal nature, which in some cases look like eggs and in others like digested cells of *Rhodymenia*. These tracks, as has been said, are always in the region of the papillæ, though the latter are occasionally found at some little distance (never far) from them, showing that the irritation is propagated over the adjoining area. Closely associated with the galls and with the more developed outgrowth, and occasionally occurring among their basal cells as well as elsewhere in the affected region, are to be found yellow masses, sometimes filling a cell or several adjacent cells or intercellular spaces. The nature of this yellow substance I have been unable to ascertain, but it may be mentioned that it resists the prolonged action of so powerful a solvent as ether; it also resists acids, at least in a higher degree than the cell walls, but it yielded slightly to exposure overnight to ammonia. Whether this substance be a direct secretion of the animal in question, or a bye-product of the diseased plant tissues, I cannot say; but from its

---

*These, of course, occur sometimes normally on the flat surface of the frond.

constant association with these outgrowths I am inclined to regard it as an animal secretion, stimulating the gall outgrowths. When the observations had reached this stage I discovered the presence in the thallus, in one of the diseased tracks, of a nematode worm, and I now seemed to have found an animal capable of effecting such results, since it recalled at once the operation of the allied *Tylenchus Tritici* Bast., the so-called "wheat eels," which cause the well-known and remarkable disease of wheat. However, it was destined to furnish a lesson in the danger of too easily accepting a solution of such difficulties; for, after carefully making several series of sections through similar tracks, I found parts of an animal which was distinctly a crustacean. By opening up and teasing out the contents of some of these channels in the thallus the entire animal was exposed in various stages of its development, only one as a rule, however, inhabiting each outgrowth. In the case of some of the older tracks the animal had evidently burst its way out of the thallus and escaped, leaving a hole at the end of a short channel in the tissues. These are, of course, entirely disorganised. In one instance I found, in the same cavity as the animal, a collection of eggs of a yellow colour, larger than those I had previously found, and shaped angularly so as to fit into one another, together forming a round body more than half as large as the animal itself. It occasionally happens that in the plants containing well-developed specimens of the crustacean there are no papillæ, while the individuals associated with the papillæ are very young.

Specimens of these crustacea were sent to the Rev. T. R. R. Stebbing, M.A., who kindly examined them, and having determined some of them as *Harpacticus* suggested my consulting Dr. G. S. Brady, F.R.S., as the final authority on Copepoda. Dr. Brady has with much kindness taken an interest in the subject, and has given the matter much attention. He determines the copepod as *Harpacticus chelifer*, and adds that there are others present as well which require further investigation. This investigation he has undertaken, and the result cannot fail to be of interest. His suggestion in a letter to Mr. Murray, that *Rhodymenia* possibly produces galls in response to the stimulus of attack by different creatures, seems in these circumstances a very probable one, and at all events it will be settled one way or the other by his further research. The figure of *Harpacticus chelifer* on the Plate is copied from Dr. Brady's *Monograph of the Copepoda of the British Islands*, vol. ii. pl. 65. I am much indebted to him for his kindness and help.

I account for the presence of the nematode by supposing it had entered through one of the holes or pits in the frond and had become embedded in the thallus; and this supposition also accounts for several foreign bodies which I have found in parts of the thallus where the yellow substance is plentiful.

I may here mention that, in the British Museum Herbarium, similar proliferations and papillæ to those on the Stonehaven material were found on a specimen collected in July, 1850, by Isaac Carroll, at Cork Harbour. Sections of this specimen presented the same appearance also, showing galls in all stages,

accompanied by the dark yellow substance always found in connection with the papillæ. I did not succeed in finding the animal in the dried specimens, but there can be no doubt about it being of the same sort as that found in the Stonehaven material, since the results in each case are exactly similar.

Since the disease thus produced on the surface of the frond outgrowths exactly similar in every respect to the marginal proliferations, the normality of the origin of these became open to suspicion. I have examined a large series of dried specimens, but without finding any trace of other than normal outgrowth of tissue in the case of the marginal proliferations. On fronds, however, on which galls are present and marginal proliferations as well, I have often found the yellow substance described at the base of these apparently normal proliferations.

Finally, I have to thank Mr. Murray for his advice and guidance, and for his generosity in placing the material at my disposal.

Description of Plate.—Fig. 1. Frond of *Rhodymenia palmata*, showing galls and the proliferations they result in: nat. size. Fig. 2. Section through frond, showing structure of gall, × 100. Fig. 3. Similar section, × 50. Fig. 4. The same, × 100. Fig. 5. Section through young proliferation, × 50. Fig. 6. Section through thallus, showing *Harpacticus in sitû*, × 100. Fig. 7. Adult female of *Harpacticus chelifer*, after Brady.

NOVITATES CAPENSES.

By G. F. Scott Elliot, M.A., F.L.S.

Pelargonium Barklyi, n. sp. (Section *Polyactium*). — Root tuberous, napiform. Branches 2–3, very short, covered with the woody bases of the old leaves. Leaves almost all radical, cordate-orbicular, shortly 7-lobed; lobes trifid and dentate; margins bearded with dense white hairs; surfaces of the leaves (as well as the whole plant) covered with scattered long white hairs; stipules lanceolate-acute. Peduncles elongate, 4–6-flowered; bracts usually 6, lanceolate; pedicels at first nodding, then erect. Sepals lanceolate, subacute, 5-nerved; margins white and ciliated at the edge. Petals obovate, cuneate, white (?), with 2 conspicuous red lines twice as long as the sepals. Stamens 5, connate at base (except the two lowest). Ovary and carpophore hairy. Seeds brown. Petioles 2–4 in.; blade $2\frac{1}{2}$ in. in diam.; peduncles over 12 in.; sepals 4 lines long and 1–2 lines broad; uppermost petal 7 lines long and 4–5 lines broad; carpophore $1\frac{1}{4}$ in. long.

Affinity near *P. pulverulentum* Colv., from which it is easily distinguished by the elongate petals, stipules, and pubescence. Also allied to an unpublished species, *P. præcox* Burchell (5013! 4926! 4854!), but with different sepals and bracts.

Hab. Namaqualand, *Mr. Reynolds*, No. 3; *Sir Henry Barkly*! In umbrosis subhumidis, Garrakoofs Poort, alt. 3000 ped., Sept.

1883, *Bolus* 6528! (Herb. Norm. Austr. Afr. 447!). Ookiegs, Namaqualand, 20/8/86, *W. C. Scully*, 81!

Lotononis eriantha Bth., var. nov. obovata.—Leaflets obovate, scarcely apiculate, finally glabrous above, thinly silky below.—*Baur* 560! 623! *Dr. Atherstone*! *Wood* 3163!

Buchenrœdera lotononoides, n. sp. — Undershrub densely silky hairy in all parts. Branches virgate, striate. Leaves trifoliolate; leaflets oblanceolate-mucronate; margins and veins densely hairy (surface finally almost glabrous); stipules linear, shorter than the petiole. Flowers purple, racemose at the ends of the branches; pedicels very short; bracts lanceolate, as long as the calyx-tube; tube of the calyx as long as its teeth. Vexillum subcordate, with a long claw, thinly hairy on the back; carina emarginate. Pod turgid, densely hairy when young. Leaflets 4–8 lines long and 2–4 lines broad; petiole about 2–3 lines long; calyx 4 lines long; vexillum about 4 lines in diam.

Side Mt. Currie, near Kokstad, East Griqualand, alt. 6500 ft., Feb. 1883, *W. Tyson* 1352! Nelson's Kop, Orange Free State, 1862, *T. Cooper* 870! also 1074! 2191!

This species is nearest *B. viminea* Presl, but it has also a distinct affinity with *Lotononis corymbosa* of Harvey.

Crassula Macowani, n. sp.—Herbaceous. Stem woody at the base, covered with white glistening bark. Leaves connate-perfoliate, rather distant, cylindrical, fleshy, acute. Peduncles elongate, dichotomous at apex; flowers subcorymbose, not crowded, very shortly pedicellate; bracts small, ovate. Calyx-tube short; teeth rounded, obtuse. Petals free, ovate, obtuse, twice as long as the calyx. Scales very small. Leaves 3–8 lines long and 2 lines broad; internodes 3–8 lines; peduncles about 3–4 in.

Banks of the Little Fish River, near Somerset East, alt. c. 2400 ft., *Scott Elliot* 529!

Near *C. expansa*, but easily distinguished by the flowers.

Chironia densiflora, n. sp.—Stem glabrous, striated. Leaves almost all radical (cauline, never more than 3 pairs), oblanceolate, tapering gradually to the base, obtuse, coriaceous, glabrous. Bracts ligulate. Peduncles and pedicels short; flowers pink. Sepals 1-nerved, acute. Lobes of the petals lanceolate, acute, longer than the tube. Anthers twisted. Filaments filiform. Stigmatic lips broad, obtuse, shortly open. Stem 1½–3 ft.; leaves 4–10 in. long and ⅓–½ in. broad; peduncle ⅓–1½ in.; pedicels under ½ in. long; flower about 8 lines long and 5 lines in diam.

Noodsberg, May, *J. Medley Wood* 121! Natal, *Sanderson* 446! Near Bedford, *Mrs. Hutton*! Marshy ground, Lushington Hill, Stockenstrom, December, *W. C. Scully* 165!

Diascia ramosa, n. sp.—Stem elongate, leafy, branched, glabrous and 4-ridged below. Leaves ovate, cordate at base, shortly petiolate, acute; margin revolute and toothed, glabrous, coriaceous in texture. Racemes rather long; pedicels filiform; bracts ovate, cordate, acute. Calyx and pedicels glandular, hairy; sepals lanceolate, acute. Saccations of petal short and rounded. Filaments glabrous. Capsule obovate, longer than the sepals.

Stem up to 2½ ft.; internodes about 1 in.; leaves about 8 lines long and 4 lines broad; racemes under 3 in.; pedicels about 6 lines long.

Nearest *D. racemulosa* Bth., but distinct.

In fruticetis sylvisque in regione superiore montis Boschberg, Somerset East, alt. 4–4500 ft., flor. Dec. Apr., *Macowan* 1968! In the bush close to the path, about 4000 ft., Boschberg, May, *Scott Elliot* 488!

Moræa (Vieusseuxia) **Elliotii** Baker, n. sp.—Corm not seen. Basal leaf single, rudimentary. Stem slender, 1–1½ ft. long, bearing a single long linear leaf from the middle. Clusters of flowers 1–2; spathe cylindrical, 2-flowered, 1¼ in. long; valves lanceolate, rigid, the outer short. Perianth bright lilac; outer segments oblong-unguiculate, ⅝ in. long, with a pale spot at the base of the blade; inner segments tricuspidate, half as long as the outer. Style-crests lanceolate. Capsule small, oblong-clavate.

Hab. Transvaal; marshes at Lake Chrissie, *Scott Elliot* 1592! Habit of *M. tenuis* Ker in Bot. Mag. t. 1047.

Aristea majubensis Baker, n. sp.—Basal leaves 3–4, rigid, linear, 3–4 in. long. Stem slender, obscurely ancipitous, 6–8 in. long, bearing 1–2 rudimentary leaves. Panicle 1–2 in. long, composed of 3–4 clusters on short ascending peduncles; outer spathe-valves oblong, ⅙ in. long, with a brown centre and membranous edge. Perianth bright blue, ⅙ in. long. Capsule small, oblong, obtusely angled, subsessile.

Hab. Natal; amongst grass on the summit of Imguela Mountain, Majuba, *Scott Elliot* 1628! Allied to *A. compressa* Buching. and *A. schizolæna* Harvey.

Gladiolus paludosus Baker, n. sp.—Corm not seen. Produced basal leaves 4, rigid, linear, erect, glabrous, a foot long, ¼ in. broad. Stem simple, a foot long, bearing 2–3 reduced linear leaves. Spike subsecund, moderately dense, 4–10-flowered, 4–6 in. long; outer spathe-valves lanceolate, green, ¾–1 in. long. Perianth-tube ½ in. long; segments bright red-purple, obovate, subequal, ¾ in. long. Stamens rather shorter than the perianth-segments.

Hab. Transvaal; marshy places near Lake Chrissie, *Scott Elliot* 1588! Near *G. involutus* Delar. (*G. trimaculatus* Lam.), Miller, Icon. 158, tab. 236, fig. 1.

G. Elliotii Baker, n. sp.—Corm not seen. Produced basal leaves about 4, rigid, ensiform, strongly ribbed, 6–9 in. long, ½ in. broad. Stem simple, about a foot long, bearing 1–2 reduced leaves. Spike dense, distichous, 4–5 in. long; outer spathe-valves oblong, ¾–1 in. long. Perianth-tube as long as the spathe; segments oblong, acute, subequal, claret-red, an inch long. Stamens shorter than the perianth-segments.

Hab. Transvaal; marshy places at Middlesberg, *Scott Elliot* 1557! Near *G. Ecklani* Lehm.; Bot. Mag. t. 6335.

G. (Homoglossum) **antholyzoides** Baker, n. sp.—Corm not seen. Leaves 4, superposed, rigid, linear, glabrous, strongly ribbed, the lowest 1½–2 ft. long, ⅓ in. broad, the second a foot long, the uppermost much shorter. Stem slender, simple, 2–3 ft. long. Spike lax, many-flowered, a foot long; outer spathe-valves lanceo-

late, green, 1–2 in. long. Perianth bright red; tube curved, 1½ in. long, widened suddenly at the middle, as in *Watsonia* and *Antholyza*, ⅛ in. diam. at the throat; segments obovate-cuneate, the three upper ¾–1 in. long, the three lower shorter. Stamens reaching nearly to the tip of the upper segments.

Hab. Transvaal; moist places near Pretoria, *Scott Elliot* 1447! Near the Cape *G. Watsonius* Thunb. (Bot. Mag. t. 450), and the *G. watsonioides* Baker, of Mount Kilimanjaro.

Anthericum (Trachyandra) **micranthum** Baker, n. sp.—Root not seen. Leaves subterete, spreading, very slender, glabrous, 3–4 in. long, minutely bristle-ciliated towards the base. Stem slender, glabrous, 2–3 in. long. Racemes very lax, simple, 2–3 in. long; pedicels solitary, ascending, articulated at the apex, the lower ¼–⅓ in. long; bracts small, ovate-cuspidate. Perianth ¼ in. long; segments linear-oblong, white, with a distinct brown keel. Stamens one-third shorter than the perianth-segments; filaments very scabrous; anthers oblong, small. Style short.

Hab. Transvaal; Dutoit's Farm near Kimberley, *Scott Elliot* 1220! Near the Cape *A. elongatum* Willd., and the Matabele-land *A. Oatesii* Baker.

A. (Dilanthes) **crassinerve** Baker, n. sp.—Root-fibres cylindrical; old leaves rather fibrous. Leaves linear-lorate, very rigid, glabrous, 3–6 in. long, ⅓–½ in. broad, with thick veins and a very thick border. Peduncle simple, ½ ft. long, with about 2 empty membranous bracts. Raceme lax, simple, 3–6 in. long; pedicels erecto-patent, articulated at the middle, the lower ½–¾ in. long. Perianth ⅓–½ in. long, white tinged with red. Stamens shorter than the perianth; filaments scabrous, rather exceeding the linear-oblong anthers. Style exserted beyond the tip of the perianth-segments.

Hab. Namaqua land, near Ookiep, alt. 3000 ft.; *Bolus* 6600! *Scully* 114!

Eriospermum porphyrovalve Baker, n. sp.—Tuber globose, under ½ in. diam., crowned with fine brown fibres. Leaves solitary, small, lanceolate, subcoriaceous, glabrous, hysteranthous, only seen in a withered state. Peduncles very slender, flexuose, 2–3 in. long. Racemes lax, 1–2 in. long; pedicels ascending, lower 1–1½ in., upper ¼–⅓ in. long; bracts ovate, minute. Perianth ⅛ in. long; segments oblanceolate, obtuse, white, with a red-brown keel. Stamens shorter than the perianth; filaments lanceolate. Capsule obovate-cuneate, ¼ in. long; valves dark purple.

Hab. Transvaal; near Lake Chrissie, *Scott-Elliot* 1602! Also Hontboxh, *Rehmann* 5765!

Albuca (Falconera) **Elliotii** Baker, n. sp. — Bulb small, globose. Leaves few, very slender, terete, glabrous. Peduncle slender, fragile, ½–1 ft. long. Racemes very lax, 3–8 in. long; lower pedicels arcuate, 1–1½ in. long; bracts lanceolate, small. Perianth campanulate, ½ in. long; segments oblong, pale yellow, with a broad brown keel. Outer stamens antheriferous. Style as long as the ovary, but little prismatic.

Hab. Transvaal; near Lake Chrissie, *Scott Elliot* **1597**! Near *A. tenuifolia* Baker in Saund. Ref. Bot. t. 335.

Ornithogalum (Caruelia) **speciosum** Baker, n. sp.—Bulb not seen. Leaves 4, linear from a broad sheathing base, thick, glabrous. Scape terete, ½–1 ft. long. Flowers 3–5 in a raceme with a flexuose rachis; lower pedicels arcuate, ½ in. long, its bract ovate-amplexicaul, acute, an inch long. Perianth campanulate, whitish, an inch long; segments oblong, obtuse, much imbricated, ½ in. broad, the three outer tipped with a large purplish-black spot. Stamens less than half the length of the perianth; filaments lanceolate.

Hab. Namaqua-land, *Scully* **175**! Habit of *O. thyrsoides* and *arabicum*, with as large a flower, with the outer segments tipped with a large black spot.

Tetrachne aristulata Hackel & Rendle, n. sp.—Rhizome bearing strong flexuous wiry roots. Culms clustered at the base, 2 ft. high, simple, erect, terete, smooth, with 3 nodes. Leaves: sheath from less than half to two thirds as long as the corresponding internode, striated, glabrous, the lowest one carinate; ligule truncate, forming a thick shortly tomentose hairy ridge round the top of the sheath; lamina about 1–2 in. long, with a triangular base passing into an elongated linear rigid terminal portion, consisting almost entirely of the prominent midrib; rounded on the back with scabrous edges. Inflorescence 2–4 in. long, racemose; axis triangular, with scabrous edges. Spikes few and distant, lower ones compound, ¾ in. long and as broad, upper ones smaller and simple, consisting of a single spikelet. Rachis plano-convex, the flattened side pressed against the axis. Spikelets secund on the convex side of the rachis, one terminal, the rest alternate; much fewer (about 8 in the largest spike) and many times larger than in *T. Dregei*, 5–6 lines long and about 4 broad; lower ones small. Glumes distichous, the two lowest much smaller than the rest, the four lower ones empty, the rest containing flowers, all smooth, glabrous, but ciliate at the base, chartaceous, ovate, carinate, with the midrib prolonged into a sharp rigid awn, and several (4 in the larger glumes) prominent nerves running parallel to the margin from base to apex. Pale included in and equal in length to the glume, colourless, very thin and membranous, with long silky hairs at its base. Seed oblong to lenticular in shape, flattened, concavo-convex, 1 line long by ½ line broad. Testa yellowish-white, loose, chaffy.

Hab. Ookiep, Namaqualand, *Scully*!

Differs markedly from *T. Dregei* Nees, which has hitherto been the only known species of *Tetrachne*, in the much larger and fewer spikelets, and the much larger and stronger many-nerved glumes, ciliated at the base, and produced into an abrupt pungent awn.

Eragrostis annulata Rendle, n. sp. — Root fibrous, wiry. Culms cæspitose, 3–7 in. high, slightly branching, glabrous, longitudinally striate, geniculate at the nodes. Leaves: sheath, lower ones carinate and strongly ribbed, scabrous, with long colourless silky hairs springing singly or in tufts from little tubercles, especially at the mouth of the sheath, upper ones similar, but

less strongly keeled and ribbed; ligule inconspicuous, represented by a row of short colourless hairs; lamina flat, 1–1¾ in. long, ¾–1½ lines broad at the widest part, lower half linear, upper tapering gradually to a long acuminate apex, midrib and two other nerves on each side prominent beneath, glabrous, with parallel longitudinal ridges between the nerves, the ridges on the upper surface surmounted by a row of microscopic upwardly curved teeth; margin undulate, furnished with teeth similar to those on the leaf, and also irregularly shaped tubercles like those on the sheath, and bearing similar hairs. Inflorescence paniculate, somewhat ovate, the stalked spikelet terminating or situated laterally on the primary branches, the main axis and branches striated and provided with microscopic upwardly curved teeth. Pedicels of spikelets 1½–2 lines long, with a curious annular thickening about half-way up each one. Spikelets 2–5 lines long, the longer ones tapering slightly upwards from a base of about 1 line breadth, the shorter ovate. Glumes distichous, 5–12 pairs, the two lowest smaller than the rest and empty, carinate, each half ovate with a prominent nerve, truncate, ¾–1 line long; the characteristic upwardly curving teeth occur on the upper part including the keel. Pale shorter and included in the glume, falcate, often persistent after the glume has fallen. Seed included between the glume and pale, brown, rounded-cubical in shape, with a depressed hilum.

Is near some forms of *Eragrostis poæoides* Beauv., from which it differs in the truncate glumes, the rounded-cubical shaped seed (oval in *E. poæoides*), and the unpolished appearance of the more linear-shaped spikelet; is also distinguished at once by the characteristic annular thickening on the pedicels.

Hab. Ookiep, Namaqualand, *Scully*!

Triraphis Elliotii Rendle, n. sp.—Culm erect, drooping above, about a foot long, simple, terete, smooth, glabrous, with 5–7 prominent nodes. Leaves: sheath shorter than the internode, rounded at the back, the midrib and two principal nerves on either side forming rather inconspicuous equal longitudinal ridges with narrower ones between, glabrous, the overlapping edges membranous and colourless, internal surface smooth and polished white; ligule inconspicuous, forming a short ridge at the mouth of the sheath; lamina several times the length of the sheath, flat, linear for about a third of its length and then tapering gradually to a long fine bristly point, the midrib and two principal nerves on either side forming slightly prominent equal longitudinal ridges, with smaller ones between; surface smooth, glabrous. Inflorescence somewhat ovate in shape, about 2 in. long, reddish-brown, densely paniculate, the shortly-pedicelled spikelets terminating or situated laterally on the secondary or sometimes tertiary axes. Primary axis terete, smooth, glabrous, those of a higher order and the pedicels of the spikelets with fine upwardly directed colourless teeth, not visible with a lens. Spikelets ovate-lanceolate, reddish-brown, pilose, with 9–10 ☿ florets arranged alternately on the rachilla, which ends in a small reduced barren floret; a tuft of bristly hairs

below each floret. Glumes: the two lowest smaller, empty, unequal, the lower one being the smaller, the longer of the two one-third the length of the spikelet; light brown, membranous; midrib strong, and produced into a strong awn about one-fourth the length of the leaf, with upwardly directed teeth; the apex has also two short lateral toothed lobes. Fertile glumes keeled, the midrib and two very prominent lateral veins each produced into a long awn with upwardly directed teeth, the central one the longest, the leaf-tissue prolonged between the awns into pointed minutely serrate lobes; provided on the back with long colourless pilose hairs, mostly confined to the nerves and midrib, thin and membranous between the nerves, the cells containing a pink sap. Pale very thin, membranous and colourless, included in and nearly equal in length to the glume, the two strong keel-like nerves toothed on the back; apex truncate, irregularly serrate.

Hab. Ookiep, Namaqualand, *Scully*!

Near the Australian *T. mollis* R. Br., which differs in its revolute setose leaves, its long panicle (6–10 in.), its somewhat narrower glume, and considerably shorter pale.

In the *Flora Australiensis*, vol. vii. p. 603 (1878), the genus is said to be limited to Australia, but in the *Genera Plantarum*, vol. iii. pt. ii. (1883), p. 1177, we read, "Species 5, v. 6, quarum una adhuc inedita Africæ australis incola, cæteræ omnes Australianæ," and "in specie capensi panicula mollis sed laxior (*i. e.*, than *T. mollis*), gluma lobi membranacei *ad latera exteriora aristarum lateralium*." In the proposed new species the panicle is as dense as that of *mollis*, while the membranous lobes of the glume are *not* on the outside of the lateral awns, but *between* these and the central ones.

A NEW *STRONGYLODON* FROM MADAGASCAR.

By J. G. Baker, F.R.S.

Strongylodon is a well-marked genus of *Phaseoleæ* allied to *Erythrina* and *Mucuna*, which till lately was only known in Ceylon and Polynesia. In 1880 a new species (*S. madagascariensis* Baker) was discovered in Madagascar by Mr. Langley Kitching, which has since been gathered by Baron and Hildebrandt (No. 3698). Now Mr. Baron has sent home a well-marked second species, which he wishes, if it is new, to be named after Miss Craven. It proves to be quite new and very distinct, and the following description is taken to a large extent from the notes which he has communicated:—

Strongylodon Craveniæ Baron & Baker, n. sp.—A climbing shrub, with a few scattered hairs on the branchlets, otherwise glabrous. Leaves pinnately trifoliolate, membranous glabrous; petiole 2–2½ in. long; end leaf suborbicular, obtuse, 2–3 in. long and nearly as broad; side ones very oblique, on short petiolules; stipules deltoid; stipulæ minute, lanceolate. Flowers in lax

racemes 8–10 in. long, with very tumid nodes, each raceme containing 60–80 flowers; pedicels 2–5 nate, about an inch long. Calyx campanulate, green, ⅓ in. long; teeth very small. Corolla pale yellow, tipped with bright red; standard oblong-lanceolate, 2½ in. long, reflexing in the expanded flower; wings oblique oblong, about half as long as the standard; keel as long as the standard, much incurved, narrowed to the acute apex. Pistil and stamens as long as the keel, hidden inside it; ovary linear, multi-ovulate. Pod not seen.

It must be a very fine plant when growing, and would be well worth introducing into cultivation.

NOTES ON *POTAMOGETON:*

AS TREATED BY DR. RICHTER IN 'PLANTÆ EUROPEÆ,' pp. 11—16.

BY ARTHUR BENNETT, F.L.S.

1. *P. explanatus* M. et K., and *P. petiolatus* Wolfg.! belong rather to *P. fluitans* than to *P. natans;* certainly the latter does.

3. Meyer. Ch. Hann. refers *P. fluitans* to *P. oblongus* as a variety.

4. *P. microcarpus* Boiss.! is at most only a subspecies or variety of *P. polygonifolius.*

5. *P. polygonifolius* Pourr. is not endemic to Europe; it occurs in Asia!, Africa!, N. Zealand!, &c.

7. *P. microstachys* Wolfg.! has no right to appear as a synonym of *rufescens* where Europe is concerned; it was founded on specimens from the Aleutian Isles. It is more entitled to be separated from *rufescens* (*alpinus*) than *P. nerviger* Wolfg. Dr. Richter has "Ducr."; the author himself wrote Du Croz.

9. *P. coloratus* Hornm. is not endemic to Europe; it occurs in Arabia, Socotra, and the West Indies.

11. *D. variifolius* Thore! is to be referred to *fluitans* (not *heterophyllus*); as long ago as 1810 it was referred to *natans* by Pohl. (*Ten. Fl. Boh.* p. 137).

P. paucifolius Opiz. in Böh. Gen. 1823, is a name only; he described it in *Naturalien-Tausch*, p. 223 (1825), but Kosteletzky characterised it as a variety of *heterophyllus* in *Cl. Anal. Fl. Boh. Phan.* p. 24 (1824.)

P. angustifolius Opiz. Böh. Gen. 1823, name only; the reference (and description) is to be found in Presl and Berchtold's *Rostlin,* 1821.

19. *P. macrophyllus* Wolfg. (1827) is adopted, instead of *P. longifolius* Gay (1816). "*P. Lonchitis* Tuckerm. in Sow." is misleading: Syme (not Sowerby) identified the Irish plant with Tuckerman's species on the faith of specimens in Gay's herbarium. This plant is not referable to *macrophyllus,* but perhaps to *heterophyllus. P. salicifolius* Wolfg., belongs rather to *decipiens* than to *macrophyllus.*

20. *P. decipiens* is not endemic to Europe; it occurs in India! and Siberia.

21. *P. prælongus* is also not endemic; it occurs in N. America!, and perhaps in the Himalayas.

26. *P. rutilus* Wolfg., is not synonymous with *Friesii* Rup., except through the many wrongly-named specimens.

28. In Nyman's *Suppl. Consp. Europ.* p. 288, we are told that *P. Grisebachii* Heuff. is "status *P. pusilli* incrustus, ex Smk." Dr. Richter makes it a full species; which is right?

29. *P. trichoides* Cham. occurs in Algeria!

30. *P. gracilis* Fries (1828) is antedated by *P. gracilis* Wolfg. (1827); this is *P. Wolfgangi* Kihlman in *Fl. Fenn. Phan.!* and Wolfgang's name must stand (cf. *Journ. Bot.* 1890, p. 299).

31. *P. fasciculatus* Wolfg.! belongs to *filiformis* ("*marinus* L."), not to *pectinatus*.

32. *P. flabellatus* Bab. was described in *Mem. Brit. Bot.* ed. 3, 1851, not "ed. 7, 1874." It is not endemic, but occurs in Canada!, Madagascar!, &c.

34. "*P. marinus* L." is not endemic; it occurs in Asia!, Africa!, America!, and Australia!

36. *P. condylocarpus* Tausch.! has nothing to do with *P. densus*, but is a variety (or subspecies) of *trichoides* Cham.

P. densus L. can scarcely be said to be "cosmop."; out of Europe it occurs rarely in Africa!, Asia Minor!, India!; not in America—an error!

Dr. Richter omits *P. Upsaliensis* Tis., *P. vaginatus* Turcz., *P. falcatus* Fryer, *P. Griffithii* Ar. Benn., and *P. Sturrockii* Ar. Benn., and he purposely ignores the so-called "species" of Gandoger.

EUROPEAN ALIENS IN AMERICA.

By T. D. A. Cockerell.

The present collection of notes is merely a summary of my observations on the spread of some species of European plants in North America, during my residence there from 1887 to 1890. During this period I lived in Colorado, and had fairly good opportunities for ascertaining the degree of influx of exotic weeds in that State; while both on my outward and homeward journeys, I made notes on the flora observable along the route.

While nearly all the species to be catalogued are well-known imported weeds in the United States, it seemed to me that recent and precise observations might be of interest; because, without doubt, every year makes notable changes in the spread of such plants, and the time will come when historical evidence will be valuable.

Ranunculus acris L. Not noticed yet in the west. Olear (N.Y.). Elmira (N.Y.). Waverley. Owego. Binghampton.

Nasturtium officinale R. Br. Purposely introduced in Colorado,

where it does well; found at West Cliff, 7,860 ft. alt.; and on Saguache Creek, above Rock Cliff (Sept. 15, 1887).

Capsella Bursa-pastoris Mœnch. Colorado, but occasional only. I found it in the Lower Hardscrabble, and at West Cliff, Custer Co., and in Fremont Co., at Canon City (5340 ft.). Mrs. M. E. Cusack found it at Manitou, El Paso Co. (6318 ft.). In the eastern States it becomes frequent. I found it at Galesburgh, Princeville, Chillicothe, Warren (Ohio), Sharon (Pa.), Lakewood, and Brooklyn.

Saponaria Vaccaria L. Single specimens frequent in Colorado; found at Two Elk Creek, Eagle Co., in 1887; and in Custer Co. at the Hugg Ranch, and other places, even as high as near the Micawber Mine (about 10,000 ft.).

Malva rotundifolia L. Has been reported in Colorado, but I did not meet with it there. In the east it is abundant. Niagara Falls (N. Y.), Rochester (Indiana), Corning (N. Y.).

Trifolium pratense L. Not yet well established in Colorado; but occurring here and there in an isolated way. Near Short Creek, Custer Co. (over 8000 ft.); Canon City, Fremont Co.; near Mace's Hole, Pueblo Co. In the more eastern States this plant is very much at home; I found it in the following localities:—East of Emporia (Kansas), near Revere, Dumas, Argyle, New Boston, Stronghurst, Galesburgh, Monica, Chillicothe, suburbs of Chicago (Illinois), Hammond (Indiana), Kouts, Rochester (Indiana), Leavittsburg (Ohio), Greenville (Pennsylvania), east of Jamestown (N.Y.), Olear (N. Y.), Corning (N. Y.), Waverly, Owego, Binghampton, Brooklyn (N. Y.).—*T. repens* L. I did not find this in Colorado, but further east it became abundant, and was observed at the following places;—Florence (Kansas), E. of Emporia, Burlinghame (Kansas), Tecumseh (Kansas), near Revere, Dumas, Argyle, New Boston, Stronghurst, Galesburgh, Monica, near Chicago (Illinois), Hammond (Indiana), Kouts, North Judson, Rochester (Indiana) Spencerville (Ohio), Leavittsburg (Ohio), E. of Warren, Greenville (Pa.), E. of Jamestown (N. Y.), Olear (N. Y.), Waverly, Owego, Binghampton, Brooklyn. — *T. hybridum* L. Brooklyn, close to Himrod Street, on a piece of waste ground.

Medicago lupulina L. Brooklyn. Not noticed in the west.—*M. sativa* L. "Alfalfa." Cultivated in Wet Mountain Valley, above 8000 ft. (Colo.).

Sonchus oleraceus L. Canon City, Fremont Co., Colorado, but not yet common in the west.

Arctium Lappa L. Owego. Binghampton. Not seen in the west.

Chrysanthemum Leucanthemum L. Not noticed in Colorado, but very common further east. E. of Oswego. E. of Binghampton. E. bank of Delaware River (N. Y.). Near New York City.

Convolvulus arvensis L. I had never seen this species in Colorado, until, in June, 1890, I came across a large patch in flower, on a piece of waste ground in Pueblo. It was growing vigorously, and will probably spread thence to other localities in the State.

Plantago major L. Dismore's Ranch, Custer Co., Colorado, but

not noticed elsewhere in the Rocky Mountains. In the eastern States it abounds. Spencerville (Ohio), Braceville, Leavittsburg (Ohio), Warren (Ohio), Youngstown (Ohio), Greenville (Pa.), Olear (N. Y.), Corning (N.Y.), Elmira (N. Y.), Waverly, Owego, Binghampton, New York City, Brooklyn.—*P. lanceolata* L. I did not meet with this in the west. Brooklyn is my only American locality.

Chenopodium album L. Exceedingly abundant in Colorado and elsewhere. Near Mace's Hole, Pueblo Co. (Colorado), Cotopaxi (Colorado), Pueblo (Colo.), near Hillside (Colo.), West Cliff (Colo., 7860 ft.), Cusack Ranch, Short Creek, Custer Co. (Colo.), Smith's Park (Colo.), near Micawber Mine (Colo.), about 10,000 ft., Chariton (Iowa), Dodge City, Kinsley (Kansas), L. Larned, Florence (Kansas), New York City.

Polygonum aviculare L. Very abundant from the east to the far west. Pikeview, El Paso Co. (Colo.), near Wales' Canon, Pueblo Co. (Colo.), Comargo, Custer Co. (Colo.), near Querida, Custer Co. (Colo.), Cotopaxi (Colo.), Hillside, Fremont Co. (Colo.), Pueblo (Colo.), Dodge City, Chillicothe, Rochester (Indiana), Brooklyn (N. Y.), West Cliff (Colo., 7860 ft.), Ula (Colo.), Splaun Ranch, Custer Co. (Colo.), Cusack Ranch, Custer Co. (Colo., over 8000 ft.), Silver Cliff (Colo.). Miss A. Eastwood reports it from Denver (Colo.). In addition to the prostrate type, the form with an erect stem occurs at West Cliff. — *P. Convolvulus* L. Becoming well-established in Colorado. Salida, Chaffee Co. (Colo.), Cusack Ranch, Willow Creek (Colo., over 8000 ft.), Hillside, Fremont Co. (Colo).

Cannabis sativa L. West Cliff, Colo., accidentally introduced, the seeds being imported to feed canaries.

Phalaris canariensis L. West Cliff, Colo. (7860 ft.); imported in the same way as the last, and only occasionally found.

Phleum pratense L. The extensively cultivated "timothy." It is grown in Wet Mountain Valley (Colo.), over 8000 ft.; and I found an escape near the Micawber Mine, at about 10,000 ft. above sea level.

Setaria viridis Beauv. Two Elk Creek, Eagle Co. (Colo.). McCook (Nebraska).

Dactylis glomerata L. Not noticed in the west. Brooklyn, New York City.

Of course this short list is very far from exhausting the subject, but it includes nearly all the more conspicuous European weeds which have become naturalised in the far west. Such plants as *Arctium Lappa*, *Cnicus arvensis*, *Dactylis glomerata*, *Ranunculus acris*, *Plantago lanceolata*, *Medicago lupulina*, *Chrysanthemum Leucanthemum*, &c., have yet to obtain a footing in the flora of the Rocky Mountains. That they will do so, in time, is hardly doubtful.

NOTES ON DORSET PLANTS.

By Edward F. Linton, M.A.

The material for the following remarks has been drawn from the south-eastern corner of Dorset, all the plants referred to having been found within a radius of ten miles of Poole Harbour. This radius takes in portions of four out of the seven divisions of the county, *viz.*, C, D, F, and G, which are formed partly, but not entirely, on watershed principles. The district has been well worked, much more so than the western parts of the county: and especially in the two genera *Rubus* and *Rosa*, in which, rich as this part of the country is, the labours of the Rev. W. Moyle Rogers, and also of the Rev. R. P. Murray, have left little room for independent comment.

Lepidium Smithii Hook., var. approaching *alatostyla* Townsend. Hedge-banks, Kinson. This form has a long style, and no notch in the fruit more often than not, but the notch is not altogether absent. Mr. Townsend tells me his variety has a short style, and no notch whatever.

Alyssum maritimum L. On the shore of Poole Harbour, near Parkstone; a garden outcast.

Viola canina × *lactea*. The Rev. W. R. Linton gathered this on a heath near Broadstone, and has tested it by cultivation.

Silene noctiflora L. A casual, with *Melilotus alba* Desv., also a casual, in a clover-field near Lytchett Matravers.

Ulex Gallii Planch., not given in the *Dorset Flora*, is the most abundant *Ulex* in this district, covering large areas of heath-land.

Trifolium procumbens L., var. *majus* Koch, *fide* Ar. Bennett. Chalky field-side, Studland.

Lotus tenuis W. & K. Lytchett Minster.

Onobrychis sativa Lam. Chalk down, near Swanage. Queried as native in *Dorset Flora*. There is every reason to believe that on the slopes of the chalk downs, where it forms part of the natural herbage, this plant is native.

Lathyrus Nissolia L. Abundant on the banks of a railway-cutting near Bailey Gate; rare in the county.

Rubus opacus Focke. By a streamlet in a rough piece of meadow. New to the county.—*R. leucandrus* Focke. Hedge-bank near Kinson.—*R. Bloxamii* × *mucronatus*. Name suggested by the Rev. W. Moyle Rogers, and accepted by Dr. Focke; gathered as a very setose variety of *mucronatus* in Foxholes Wood, near Bailey Gate.—*R. corylifolius* × *rusticanus* formed a dense bush in a hedge not far from Bailey Gate Station, which was entirely barren.

Rosa rubiginosa L., var. *comosa* Ripart. Between Littlesea and Poole Harbour. Also near Lytchett Matravers.—*R. canina* L., var. *obtusifolia* Desv. Kinson.—Var. *surculosa* Woods. Tarrant Keynston; new to county. — *R. lucida* Ehrh. Rough border of an old brick-yard.

Drosera intermedia Hayne, var. *subcaulescens* Melvill. The older

plants had strong wiry stems, denuded of their leaves by decay. Bog at Kinson.

Callitriche obtusangula Le Gall. Low-lying but not brackish ditch near Wareham.

Epilobium obscurum × *parviflorum*. Shallow drain by road-side, Lytchett Minster.

Carum segetum Benth. (*Petroselinum segetum* Koch). Road-side, West Lulworth.

Caucalis arvensis Huds. North of Wareham. Not common in the county, and not given in the *Flora* for district D.

Aster Tripolium L. A stout dwarf form with handsome flowers in a compact corymb grows on precipitous rocks near Swanage.—*A. Novi-Belgii* L. An escape on the bank of a tidal pool near Lytchett Minster.

Senecio erucifolius L. A dwarf farm with very broad segments of the leaves on calcareous slopes, West Lulworth.

Matricaria inodora L., var. *salina* Bab. Parkstone.

Calluna Erica DC., var. *incana*. Sandy ground by Littlesea.

Centunculus minimus L. Hamworthy.

Gentiana Amarella L., var. *præcox* Raf. Very abundant on short turf sloping towards the cliff near Durlstone Head, in 1889.

Verbascum Blattaria L. Among quarry *débris*, near Swanage.

Bartsia viscosa L. Lytchett Minster.

Rhinanthus Crista-Galli L., var. *fallax* Koch, *fide* Ar. Bennett. A handsome branching plant with yellow green-tipped bracts, the serrations of which are remarkably aristate. I have seen the same plant growing in S. Hants, and also specimens of it from N. Hants. It was plentiful in meadows at Wareham, in districts C, D, and G.

Utricularia intermedia Hayne. Heath near Bournemouth; very scarce in Dorset.—*U. minor* L. and *Pinguicula lusitanica* L. occur in the same locality.

Mentha arvensis L., var. *Nummularia* Schreb. Near Hamworthy; name agreed to by Mr. J. G. Baker.

Galeopsis Tetrahit L., var. *bifida* Boenn. Border of Foxholes Wood, near Bailey Gate.

Lamium purpureum L., var. *decipiens* Sonder. In some quantity in a potato-strip by the railroad near Bailey Gate. New to the county.

Scleranthus annuus L., var. *biennis* Reut. Heath near Bournemouth, in Dorset; also on gravel on the same heath, within the Hants border. This is spoken of in Babington's *Manual* as a "biennial state" of *S. annuus*, and evidently regarded as no more than this by Hooker in the *Student's Flora*. I think it is the original form of the plant, at least the *native* form in this country, growing as it does on bare places or undisturbed heaths. I have seen it on a gravelly heath in E. Norfolk, and on sandy soil never brought under cultivation near Swaffham, in W. Norfolk, always preserving its dense habit of growth, and with little or no grooving of the fruit. It is likely that *S. annuus* may have been developed out of *S. biennis* by reason of cultivation, which would in course of time attenuate its structural growth, and interfere with its biennial

habit; but not likely that a weed of cultivation should produce a plant preferring a gravelly waste for a habitat.

Atriplex Babingtonii Woods, var. *virescens* Lange. Studland. Name given by Mr. Ar. Bennett.

Polygonum Persicaria L., var. *elatum* Gr. & Godr. Nursery-garden, near Bournemouth. — *P. minori-Persicaria* A. Br. Boggy border of a ditch, Wareham. I took this for a strangely large and suberect variety of *P. minus* Huds., but, after some discussion with Mr. Ar. Bennett, accepted his suggestion of the above name. It should be added that *P. Persicaria* was present in quantity, but *P. minus* was not seen, and is exceedingly rare in Dorset. — *P. mite* Schrank. Wareham; Sturminster Marshall, and Shapwick.

Betula glutinosa Fr., var. *pubescens* Wallr. Boggy hollow, Kinson.

Salix triandra L., var. *Hoffmanniana* Sm. Wareham. Corfe.— *S. Smithiana* Willd. Wareham. — *S. aurita-cinerea* Wimm. (× *S. lutescens* Kerner). Swanage to Ulwell; Kinson.—*S. repens* L., var. *prostrata* Sm. Kinson.

Juncus diffusus Hoppe. Wet pasture near Bailey Gate. — *J. supinus* Moench, var. *Kochii* Bab. Man. Talbot Heath. — *J. acutiflorus* × *lamprocarpus* (Buchenau). Growing with both parents by Littlesea.

Lemna trisulca L. Wareham (district D).

Potamogeton rufescens Schrad. In a boggy drain near Wareham, with *P. acutifolius* Link. Recorded for the county, but not in the *Dorset Flora.*

Scirpus Savii Seb. et Maur. (*S. numidianus* Wahl.). Brackish drain near Hamworthy Junction.

Rynchospora fusca Roem. & Schult. Boggy drain, Talbot Heath.

Carex axillaris Good. Growing with *C. remota* and *C. vulpina* near Swanage. Sir J. D. Hooker, in the *Student's Flora*, suggests *C. remota* and *C. muricata* as the probable parents of *C. axillaris.* But is it not more probable that it owes its origin (if a hybrid) to *C. remota* and *C. vulpina*, which I see is quoted in Townsend's *Flora of Hants* as the opinion of M. Crépin?

Briza minor L. Lytchett Minster. Apparently not often met with in Dorset.

Festuca rubra L., var. *pruinosa* Hackel. Durlstone Head. — *F. elatior* L., var. *pseudo-loliacea* Hackel. Very fine by the River Stour, Sturminster Marshall.

Bromus secalinus L. Plentiful in the same meadow as the last. This looks like a native station, as the meadow lies low, and, being liable to floods, would always have been in pasture. It is possible that a flood may have brought the original seed, carried down from arable land higher up the river; and this possibility weakens the evidence in favour of the grass being native, which this occurrence of it in meadow-land otherwise affords. — *B. erectus* Huds., var. *villosus* Bab. Chalk slopes between Swanage and Studland.

Nitella translucens Agardh. Pond near Bournemouth, of recent formation, but fed by one of the sources of the Bourne. Mr. James Groves agreed to the name. New to the county.

Several rare plants which I have met with in the district to which the foregoing notes refer have been purposely omitted, either because the knowledge of their locality was due to the guidance or the information of friends, or because I was aware that I could throw no additional light on their distribution by their mention. My purpose has been to fill in some of the gaps in the *Dorset Flora*, which is on the eve of being superannuated; and this will account for the introduction of some common or well-distributed species into my paper.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 21.)

Trevelyan, Sir Walter Calverley, Bart. (1797–1879): b. 1797; d. Wallington, Northumb., 23rd March, 1879. B.A., Oxon, 1820. M.A., 1822. Succeeded as 6th Bart. 1846. Discovered *Trichonema Bulbocodium*, Mag. Nat. Hist. 1834. 'Vegetation of Faroë Islands,' Edinb. Phil. Journ. 1835, and Florence, 1837. Contrib. to E. Bot. 2798. R. S. C. vi. 34; viii. 1114; Gard. Chron. 1879, i. 412; Journ. Bot. xvii. 160; Trans. B. S Ed., xiv. 8.

Trimmer, Rev. Kirby (1804–1887): b. Poplar, Middlesex, 22nd Dec. 1804; d. Norwich, 9th Oct. 1887; bur. Crostwick, near Norwich. B.A., Oxon, 1828. Vicar of St. George Tombland, Norwich, 1842. 'Flora of Norfolk,' 1866. Supplement, 1884. Ann. Bot. 1888, 412; Journ. Bot. 1887, 383; Pritz. 323; Jacks. 257.

Tupper, James Perchard (fl. 1797–1821). Of Guernsey. M.D. F.L.S., 1797. Pupil of J. E. Smith. 'Sensation in Vegetables,' 1811. Pritz. 325; Jacks. 82.

Turnbull, Robert (1813?–1891): b. Knaresboro', Yorksh., 1813?; d. Scarborough, 19th Jan. 1891. Steward to Lord Derwent. Pupil in Geology and Engineering of William Smith. 'Index of British Plants,' 1890. 'Land Agents' Record,' xxvi. 92.

Turner, Dawson (1775–1858): b. Yarmouth, 18th Oct. 1775; d. Brompton. London, 20th June, 1858. Banker. Of Yarmouth. F.L.S., 1797. 'British Fuci,' 1802. 'Botanist's Guide' (with Dillwyn), 1805. 'Muscologicæ Hibernicæ Spicilegium,' 1804. 'Fuci,' 1808–19 (many plates by his wife). Contrib. largely to E. Bot. Discovered *Mathiola incana*, 1806. Collections at Kew. Pritz. 325; Jacks. 614; R. S. C. vi. 67; Proc. Linn. Soc. 1858–59, xl.; 'Athenæum,' 1858, ii. 82. Engr. after Davis, 1816, and photo. from oil portr. at Kew. Allibone. *Dawsonia* R. Br.

Turner, James (fl. 1805–1808). Of Harleston, Norfolk. F.L.S., 1806. Brother of Dawson Turner. Lichenologist. Contrib. to E. Bot. 1499–1501, 1892, 2683.

Turner, John (fl. 1820). F.L.S., 1821. Asst. Sec. R. Hort. Soc., 1820. *Ipomæa tuberosa*, Trans. Hort. Soc. i. 184. R. S. C. vi. 69.

Turner, Miss Magdalene (fl. 1848–1880). Of Oxford. Sent Jersey Algæ to Harvey for 'Phycologia Britannica' (t. 315). *Cladophora Magdalenæ* Harv.

Turner, Robert (fl. 1654–1687). Of Holshot. 'Botanologia,' 1664, with portr. Another portr. in his translation of Moulton's 'Bone-setter,' 1665. Pult. i. 180; Pritz. 325.

Turner, Rev. William (d. 1568): b. Morpeth, Northumb., between 1510 and 1515; d. London, 7th July, 1568; bur. St. Olave's, Hart Street. B.A., Camb., 1529–30. M.A., 1533. M.D., Ferrara or Bologna, and Oxford. Dean of Wells, 1550. "Father of English Botany." 'Libellus de re herbaria,' 1538, reprinted with biog. and bibliog. by B. D. Jackson, 1877. 'Names of herbes,' 1548, reprinted 1882. 'Herbal,' 1551–1568. Had a garden at Kew. Pult. i. 56; Rees; Pritz. 325; Jacks. 614; Fl. Midd. 364; Cott. Gard. vii. 107. Portr. *teste* Wadd. *Turnera*.

Turton William (fl. 1803). M.D. Of Swansea. Discovered *Draba aizoides* E. Bot. 1271, 1338. Prepared a pocket flora.

Twamley [See MEREDITH.]

Tweedie, James (1775–1862): b. 1775; d. Santa Catalina, Buenos Ayres, 1st April, 1862. 'Buenos Ayres,' Mag. Zool. Bot. iv. (1840) 8. Collected in Buenos Ayres, 1835: plants sent to Hooker. Letter in Comp. Bot. Mag. i. 235. R. S. C. vi. 73; Journ. Bot. 1834, 178; Lasègue, 486.

Twining, Elizabeth (1805 ?–1889): b. 1805 ?; d. Twickenham, Middlesex, 24th Dec. 1889. 'Illustrations of Natural Orders,' 1849–55, ed. ii. 1868. 'Lectures on Plants,' 1858. 'The Plant World,' 1866. Pritz. 326; Jacks. 615; R. S. C. vi. 74.

Tyas, Rev. Robert (1811–1879). B.A., Camb., 1848. M.A., 1856. 'Wild Fl. of England,' 1848–60. Pritz. 326; Jacks. 615.

Tylor, Alfred (1824–84): b. 26th Jan. 1824; d. Carshalton, Surrey, 31st Dec. 1884. Geologist. F.L.S., 1849. 'Growth of Trees and Protoplasmic Continuity,' 1886. Geol. Mag. 1885, 142; Proc. Geol. Soc. 1885, 42.

Tyson, Rev. Michael (1740–80): b. Stamford, 19th Nov. 1740; d. Lambourne, Essex, 3rd May, 1780; bur. Lambourne. B.A., Camb., 1764. M.A., 1767. B.D., 1775. F.R.S., 1769. Rector of Lambourne, 1776. Friend of Israel Lyons and Gray. "His skill in botanical researches was exceeded by few," Cole MS. 5886. Nich. Anec. viii. 204–210; Ray Lett. 482.

Underwood, John (fl. 1800). Superintendent, Dublin Society's Bot. Garden, Glasnevin. 'Cat. pl. . . . . Glasnevin,' 1800. White, 'Grasses of Ireland,' xvi.; Jacks. 411.

Uvedale, Rev. Robert (1642–1722): b. Westminster, 25th May, 1642; d. 17th Aug. 1722. B.A., Camb., 1662. M.A., 1666. LL.D., 1682. Master of Enfield Grammar School, circ. 1670. Rector of Orpington, Kent, 1696. Correspondent of Magnol, Sloane, Sherard, Petiver, Dale, &c. Had a large garden of exotics. Herbarium in Herb. Sloane, vols. 302–315. Pult. ii. 30; Rees

(sub *Uvedalia*); Rich. Corr. 15; Journ. Bot. 1891, 9. *Uvedalia* Br. = *Mimulus* in part.

Vachell, Rev. George Harvey (fl. 1800–36). Chaplain to Factory at Macao. B.A., Camb., 1821. Plants in Herb. Hook. (Kew) and Fielding (Cambridge). Wight & Arn. Prod. Fl. Ind. 272. *Vachellia* W. & A. = *Acacia Farnesiana*.

Vaizey, John Reynolds (1862–89): b. London, 10th Sept. 1862; d. Cambridge, 24th Feb. 1889; bur. Broxbourne, Herts. M.A., Cambridge, 1888. Visited Norway for Mosses, 1887. Papers on Structure of Mosses in Journ. Linn. Soc. 1887; Ann. Bot. 1888–90.

Valentine, William (d. 1884). Of Nottingham. F.L.S., 1831. 'Theca in Mosses,' Linn. Trans. 1833. 'Stomata in Mosses,' Linn. Trans. 1838. 'Pilularia,' Linn. Trans. 1839. R. S. C. vi. 101.

Varenne, Ezekiel George (1811–87): b. Marylebone, 6th May, 1811; d. Kelvedon, Essex, 22nd April, 1887; bur. Kelvedon. Surgeon. M.R.C.S., 1833. Lichenologist. Contributed to Phytol. iii., 'Gibson's Flora of Essex.' Herbarium in possession of E. D. Marquand. R. S. C. vi. 110.

Vaughan, James (fl. 1853). M.R.C.S. Asst. Surgeon, Bombay Army. 'Drugs observed at Aden,' Pharm. Journ. xii. (1853). R. S. C. vi. 114.

Veitch, James (1792–1863): b. Killerton, Exeter, 25th Jan. 1792; d. Exeter, 14th May, 1863. Bought Knight and Perry's nursery, Chelsea, 1853. Cott. Gard. xiii. 273, with portr.; xxix. 362.

Veitch, John Gould (1839–70): b. Exeter, April, 1839; d. Coombe Wood, Surrey, 13th Aug. 1870; bur. Brompton Cemetery. Son of preceding. F.L.S., 1866. Visited Japan, China, and Philippines, 1860; Australia and Pacific, 1864. Introduced many plants. Proc. Linn. Soc. 1870–71, xc.; Gard. Chron. 1870, 1117. *Veitchia* Wendl.

Velley, Thomas (1749?–1806): b. Chipping Ongar, Essex, 1749? d. Reading, Berks., 8th June, 1806. Lieut.-Col., Oxford Militia. D.C.L., 1787. F.L.S., 1792. Of Bath, and afterwards Liverpool. Algologist. 'Coloured figs. of Marine Plants,' 1795. Correspondent of Dawson Turner. Herbarium, 18 vols., with notes, in Liverpool Bot. Gard. Pritz. 330; Jacks. 242; R. S. C. vi. 131 (omitting No. 4); Smith Lett. ii. 343; Linn. Trans. v. 145; E. B. 1690; Ann. Bot. ii. 593; Naturalist, iv. (1839), 398; Gent. Mag. lxxvi. 1806, vi. 588. *Velleia* Sm.

Vernon, William (fl. 1688–95). B.A., Camb., 1688. M.A., 1692. Studied Mosses. Sent plants from Maryland to Petiver. Plants from E. Indies and Maryland in Herb. Sloane (59, 72, &c.). Mus. Pet. nos. 89, 566. *Vernonia* Schreb.

Vicary, N. (fl. 1835–53). Major, 2nd European Regt. 'Botany of Sinde,' Ann. Nat. Hist. i. 420. Journ. Asiat. Soc. Bengal, xvi. 1152 (1847). "Small but very valuable herbarium" at Kew, Fl. Indica, i. 70. R. S. C. vi. 149. *Vicarya* Wall. = *Myriopteron*.

Voight, Johann Otto (1798–1843): b. Nordborg, Sleswick, 22nd March, 1798; d. London, 22nd June, 1843. Surgeon to Danish

Govt., Serampore, 1827; Supt. Bot. Gard., Serampore, 1834; of Bot. Gard., Calcutta, 1842. 'Hortus Suburbanus Calcuttensis' (ed. Griffith), 1845. Pref. to Hort. Suburb. Calc.

(To be continued.)

SHORT NOTES.

Autumnal Blossoming of Mercurialis perennis (see Journ. Bot. 1890, 356). — The autumnal blossoming of this plant came under my notice again in November last. The station was under a low hedge with a northern aspect, on a hill-top to the west of Luton, Beds. The plants were in fine condition, the staminate flowers being much more numerous than the pistillate. The autumnal inflorescence is different in appearance from the earliest vernal, the former having finer stems and fuller foliage, more like those of the latter part of the spring. This second blossoming has been repeatedly observed in South Beds since 1880, and I believe it is of so frequent an occurrence that a description of the plant in a British Flora would be incomplete without a reference to the fact. —J. Saunders.

Carex montana in Bucks. — On July 29th, 1889, I found one specimen of this plant in a rough broken piece of ground with trees, undergrowth, and springs, near some pottery works in the parish of Chalfont St. Peter's, about four miles from Uxbridge, Bucks. I believe it has not been recorded from this county before.—E. Armitage.

Callitriche polymorpha Lönnroth in Surrey. — A request by Dr. T. Morong for a set of the British species of *Callitriche* caused me to overhaul my gatherings of several years, laid aside from want of leisure to examine them. Among them I was much pleased to find good specimens of the above plant, showing the characters of the stigma, bracts, &c., admirably, and well matching the drawings of Lönnroth. The specimens were gathered in June of last year near Mitcham, and I hope to be able to obtain a supply for the Exchange Club this coming season. Its probable occurrence as a Surrey plant will be found indicated in this Journal for 1888, p. 233.—Arthur Bennett.

Cinclidotus riparius (p. 53). — I regret that, owing to an unfortunate oversight on my part, Mr. J. E. Bagnall's name was omitted from my note. It is only fair to him that this should be rectified, as Mr. Bagnall was the first to authenticate this moss.—Arthur W. Weyman.

NOTICES OF BOOKS.

Plantæ Europeæ. Enumeratio systematica et synonymica plantarum phanerogamicarum in Europa sponte crescentium vel mere inquilinarum autore Dr. K. Richter. Tom. i. [Gymnospermæ: Monocotyledones]. 8vo, pp. vii. 378.

Dr. Richter has undertaken a useful work in the compilation of this synonymic list of European plants, the value of which is

much increased by the excellent index which he has provided. Taking as his basis the arrangement and sequence of genera in Engler and Prantl's great work, *Natürliche Pflanzenfamilien*, he has brought together the most complete enumeration which has yet appeared of the synonyms of the European flora, and this is printed in a way which facilitates reference, and indeed leaves nothing to be desired.

The question of priority of publication is of course constantly being raised, and Dr. Richter has adopted a course which is, we think, to be regretted. He says:—"Puncto prioritatis publicationis pauca verba addere liceat. Quantum potui enim illam respexi et veterem consuetudinem botanicorum secutus nomen istud quam vetustissimum accepi, quod in quovis genere speciei tributum sit; si vero hoc nomen dubium est, vel in novo genere jam ad aliam speciem significandam usum, illo nomine usus sum, quod mihi ad signandam speciem maxime usum et minime dubium videbatur, opinione ductus in hoc casu monographo soli talem denominationem licere, alii vero, ne turbam synonymorum augeat vel magis turbet cavendum esse." Pre-Linnean names and "nomina Gandogeriana" are ignored.

There is no need for us to enter upon a renewed discussion upon a matter on which our view has been declared more than once in these pages. We have adhered to the DeCandollean "Laws," and we see no reason for withdrawing our adhesion. But this in no way detracts from our appreciation of the value of Dr. Richter's work, especially as the follower of the "Laws" can easily select from the careful synonymy the name which the species ought, in his opinion, to bear.

The following citation will show Dr. Richter's mode of citing synonyms, and the general arrangement of the book:—

"**Cutandia.**

C. maritima [*L.*] *Bth. & Hook.* gen. pl. iii. 2, p. 1188 (1883).
Syn.: Brachypodium maritimum *R. S.* syst. ii. p. 743 (1817).
Festuca dichotoma *Forsk.* descr. p. 22 (1755).
F. lanceolata *Forsk.* ibid.
F. maritima *DC.* fl. fr. iii. p. 47 (1805).
F. robusta *Mut.* fl. fr. iv. p. 118 (1837).
Poa maritima *Pourr.* act. toul. iii. p. 325 (1783).
Sclerochloa dichotoma *Lk.* h. ber. i. p. 150 (1827).
Scl. maritima *Lk.* l. c. ii. p. 150 (1833).
Scleropoa maritima *Parl.* fl. it. p. 468 (1848).
Triticum maritimum *L.* Sp. pl. ed. ii. p. 128 (1762).
Regio mediterranea (sensu amplo)."

It will be noted that the synonyms are arranged alphabetically, first by genera and then by species: any doubt as to priority is at once settled by the excellent plan of attaching the date to each.

The preceding species of the genus stands as "*C. memphitica* [Spr.]," and the following as "*C. divaricata* [Dsf.]": both, we presume, are intended to be cited by future authors as "*C. mem-*

phitica [Spr.] Richt." and "*C. divaricata* [Dsf.] Richt." Now it seems to us that, granting that Dr. Richter is right in ignoring in favour of the earlier specific name *memphitica*, Willkomm's name, *C. scleropoides*, for the plant on which he founded his genus, it is impossible to show any reason why Bentham & Hooker should not be cited for this species and *C. divaricata*, as well as for *C. maritima*. These authors say, under *Cutandia*:—"Huc pertinent præter *Festucam mephiticam* Boiss., quæ species typica: *C. scleropoides* Willk., *F. divaricata* Desf. Fl. Atl. t. 22; *F. maritima* DC.," &c. Why one should be taken and the other left, perhaps Dr. Richter can explain: the course adopted certainly needs explanation.

Some of our readers will be interested in seeing how British plants fare in this enumeration. Mr. Bennett has therefore kindly examined Dr. Richter's treatment of *Potamogeton* in some detail, and his notes will be found at p. 75. We have not space to go through the whole work, but the following notes will give an idea of its style and execution. *Sparganium neglectum* is placed as a variety "b." under *S. erectum* L., which name is retained in place of *S. ramosum* Huds. The species of *Triglochin* have a feminine instead of a neuter determination, although Linné named them in the latter form. Our species of *Alisma* are allocated to three genera, and stand as *Alisma Plantago* L., *Echinodorus ranunculoides* "[L.] Englm. in Aschs. Fl. d. Prov. Brandb. i. p. 651 (1864)," and *Elisma natans* "[L.] Buchen. in Pringsh. Jahrb. vii. p. 19 (1869–70)." Tournefort's genus *Damasonium* is revived, and our *Actinocarpus* now stands as *Damasonium Alisma* Mill. Dict. (1759). *Anthoxanthum Puellii* (which should have only one *l*) is made synonymous with *A. aristatum* Boiss. (or, as Dr. Richter prefers to write, "*Bss.*"—an abbreviation which would equally stand for Besser), an earlier name. Our "Holy-grass" stands as "*Hierochloa odorata* [L.] Whlb. fl. ups. p. 32 (1820)": Linné described it as *Holcus odoratus*. Here the spelling of the genus adopted by its founder is ignored.

Agrostis nigra is retained as a species peculiar to England. "*Ammophila arenaria* [L.] Lk. L. ber. i. p. 105 (1827)" supersedes *A. arundinacea* Host. (1809); and "*Arrhenatherum elatius* [L.] M. K. in Röhl. D. fl. i. p. 546 (1823)" replaces *A. avenaceum* Beauv. (1812). *Sclerochloa* is restricted to *S. dura*, our other species being referred to *Atropis* and *Scleropoa*.

"*Bromus Benekeni* Syme" is recognised as a species; and we may take this as a text on which to base one or two remarks which have suggested themselves in other cases. First, we doubt whether, on Dr. Richter's principles, the name should not stand as "*Bromus Benekeni* [Lge.) Syme." Lange's name (*Schenodorus Benekeni*) was first published, not in the '*Oversigt ov. d. k. d. Vidensk. Selskabs. Forh.* 1871,' from which Dr. Richter cites it, but in *Flora Danica*, t. 2826 (1871). From internal evidence we are inclined to think that this appeared prior to the number of *English Botany* in which Syme described the plant, which was issued late in the same year.

A more important point, however, calls for remark. Dr. Richter attributes the species to Syme, and refers to *Eng. Bot.* ed. 3, xi. 157, in support of his statement. But Syme does not rank the

plant as a species: he writes, "*Bromus asper* Murray. . . . . ? var. β. *Benekenii*." He seems to have been doubtful as to the position of the plant: how, then, can it be right to make him sponsor for the species? The golden rule, "Never make a man say what he has not said," is completely set at nought here; and it seems to us that those who follow Dr. Richter must cite the species as "*B. Benekeni* [Lge.] Richter." If Syme is the authority, the name must stand as *Benekenii*, not *Benekeni*.

Hordeum sylvaticum Huds. becomes "*H. europæum* [L.] All. fl. ped. ii. p. 260." On the question of conforming to classical spelling, Dr. Richter is hardly consistent: he follows Hudson here in writing *sylvaticum*, but cites Salisbury as using the form *silvaticum*, which he does not; and on p. 118 Hudson is credited with *Festuca silvatica*, which he did not write.

We are tempted to continue these interesting investigations, but the exigencies of space forbid. One addition, however, may be made to the changes of name which our British plants have still to undergo. The plant which we are learning to call *Cladium germanicum* Schrad.—a name which antedates by four years Brown's *C. Mariscus* (1810)—must be known as *C. jamaicense* Crantz.: this name appears in Crantz's *Institutiones*, i. 362 (1776). Dr. Richter will of course retain *Mariscus* as the specific name, on the ground that it was employed by Linnæus (under *Schœnus*). But he does not even cite *C. jamaicense* as a synonym; and, by a curious slip, he attributes the genus to Robert Brown, instead of to Patrick Browne, who established it in his *History of Jamaica*.

The Genus Masdevallia. Issued by the Marquis of Lothian, K.T., chiefly from his collection of Orchids at Newbattle Abbey. The plates and descriptions by Miss Florence H. Woolward, with vignette engravings from photographs, and additional notes by Consul F. C. Lehmann (German Consul in the Republic of Colombia). Folio. Part I. £1 10s. Grantham, 1890.

There is no Natural Order to which more interest now-a-days attaches than that which includes the many curious and beautiful forms of Orchids. To introduce new ones horticulturists have searched far and wide, from the tropical jungles of Malaya to the cooler heights of the South American Andes. Unlimited time and care has been spent on their cultivation; their selection and hybridisation has become a study in itself, leading to beautiful and striking results; and the highest scientific culture has been applied to the solution of the many biological problems presented in the various, often extremely complicated, form and arrangement of the parts.

It is therefore somewhat surprising to find so few recent monographs of the genera. Numerous plates and descriptions—good, bad, and indifferent—of individual species are scattered through the horticultural and scientific journals, but a good systematic revision of a whole genus is a rarity. The advent

of a new monograph is therefore matter for congratulation, if, as in the present case, it comes with the assurance of careful study and research.

Of all dried plants the Orchid is the most difficult to restore to any semblance of its original symmetry, yet I suppose the majority of species have been described and revisions of genera compiled from dried material, consisting often only of single flowers. Miss Woolward has studied and drawn the living plants from Lord Lothian's collection at Newbattle Abbey; other collectors have also kindly supplied material, and those who have had the opportunity of watching the work in progress can testify to the care with which she has compared specimens coming from various sources. But, to know it thoroughly, the living plant must be studied in its native home. Consul Lehmann has for many years collected Masdevallias in the mountains of Central and Tropical South America, where alone they are to be found, and he contributes valuable notes on distribution and habitat, the altitudes between which individual species occur, the mean temperature of the locality, and the variations of atmospheric humidity at different seasons of the year. His experience is often a help in the critical distinction of species and varieties. For instance, in the case of *Masdevallia Ephippium*, he confirms the opinion arrived at, from comparative examination of the two plants, that the Reichenbachian species *M. achrocordonia* must be included here, considering it "to be merely a local variety peculiar to the eastern slopes of the Andes, the type being found upon the western slopes." Consul Lehmann has found many new species, some of which will make well-defined groups where before we have known only a solitary individual, and others, I believe, will constitute quite new sections. His drawings will be published in later parts of the work, and he will add a chapter on the geographical distribution of the genus, illustrated by a map.

The present number includes ten species, forming a very fair representation of the whole genus, which numbers some 150 species. They are arranged in alphabetical order, but at the end a synopsis will be given showing the sections into which the genus is divisible. Hitherto this has not been possible, for though Reichenbach has indicated various sectional divisions among his frequent notes and descriptions in the *Gardeners' Chronicle* and elsewhere, they have nowhere been brought together in a systematic form; in fact, to quote the useful Manual published by Mr. Veitch, and noticed in this Journal for 1890, p. 30, "necessary material is not yet available." With Mr. Rolfe's assistance, Mr. Kent then "brought together those Reichenbachian sections that include most of the species described, and indicated the characters upon which they have been framed; but," he goes on to say, "as stated above, other species are cultivated in a few collections, and many more have been described from dried specimens, while others are but still very imperfectly known." In the full light which we hope will now be thrown upon the genus and its affinities, we shall look for a thoroughly scientific as well as useful classification.

It will be evident, even from the few species described in Part I., and to those who are almost unacquainted with the genus, that there are several very distinct groups. Compare, for instance, *Masdevallia rosea*, with its almost converging sepal-limbs and its tiny labellum quite concealed at the base of the long slender sepaline tube, with *M. bella*, whose strikingly developed lip gives the name to the very distinct section *Saccolabiatæ*, where the sepals spread almost at right angles to their insertion on the top of the ovary. *M. Veitchiana*, again, one of the most commonly cultivated species, has a medium-sized tube, with brilliant, spreading sepal-limbs, and a small lip.

The genus includes a few dwarf forms, with very pretty neat little flowers, and these are represented in Part I. by *M. simula*, "widely distributed over the Andes of Colombia and Ecuador," which Consul Lehmann thinks "more of a *Pleurothallis* than a *Masdevallia*." The other species included are *M. amabilis*, *M. Chestertonii*, *M. Ephippium*, *M. macrura*, *M. peristeria*, and *M. torta*. In each case there is a hand-coloured lithograph, the natural size of the plant, showing all stages from the young bud to the fully-opened flower, and a complete series of floral dissections which, we learn from the Preface, met with Prof. Reichenbach's cordial approbation, and it is at his suggestion that the apices and sections of the leaves are also figured. These dissections will form one of the most useful parts of the work to those interested in the systematic arrangement of the genus. At the head of each description is a vignette engraving of the plant taken from a photograph. The descriptions are full and accurate, and are followed by an interesting and apparently exhaustive account of the discovery and introduction of the species, its distribution, habitat, and the nature and variation of the conditions under which it grows.

I am glad to note that Miss Woolward has discovered nectaries in three out of the ten species; their existence has not been previously recognised, though, considering the brilliant colour of the flowers, something of the sort was certainly to be expected. In those species where honey is not actually secreted, it seems probable that some tissue round the base of the tube will prove sweet to the taste, affording a repast to the bird or insect which is so evidently invited by the varied and striking colours of the floral envelope. I do not know whether Consul Lehmann has studied to any extent the methods of fertilisation in *Masdevallia*, an account of which would form a most interesting chapter in biology. The bidden guests must comprise very different classes to bring about effective pollination in flowers of such widely different size and form, as, for instance, the tiny *M. simula*, the *Coriaceæ* section with their honeyed cups and rigid less-spreading sepals, and the richly-coloured large-lipped *M. bella*. If the authors are able to tell us something also of this, their Monograph will leave little to be desired.

A. B. Rendle.

A Revised List of the British Marine Algæ. By E. M. Holmes and E. A. L. Batters (*Annals of Botany*, vol. v., No. xvii. December, 1890: published Jan. 1891).

The extraordinary progress of the study of Marine Algæ in this country during the last few years has been not only expressly noted in the pages of this Journal, but the pages themselves have borne the most direct kind of testimony to the fact, as have also the publications of the Linnean Society, the *Annals of Botany*, and other public journals. It had therefore become a reproach to us that, since Harvey's *Phycologia*, no enumeration existed of our marine flora, though it was well known to all that it had received large additions. Besides this inconvenience, the synonymy of Algæ, always kaleidoscopic,—though perhaps this word might be better compounded of another adjective,—had undergone varied changes, and it had become matter of research to trace Harveyan names through the works of continental writers. No two men in this country have been more active in effecting these additions to our flora or more indefatigable in the pursuit of the systematic study of Marine Algæ than Messrs. Holmes and Batters. A duty therefore lay upon them of furnishing us with some record of their work which should be of service to fellow-workers—a guide to them in the prosecution of research. This is now before us in the form of a check-list of British Marine Algæ, with the Harveyan names quoted (where different), and the distribution indicated by a system of symbolical numbers, for the sake of brevity.

As for the list itself, and the careful research of which it is the outcome, there can be nothing but praise. It is thoroughly well done, and I shall abstain from further comment on it, since such would be concerned merely with petty details. The method of quoting the distribution is another matter, and certainly calls for legitimate criticism. The British coast has been divided into fourteen sections, thus:—

"1. From the Shetland Islands to the Sound of Mull.
2. From the Sound of Mull to the Solway Firth.
3. From the Shetland Islands to Aberdeen.
4. From Aberdeen to the Tweed.
5. From Solway Firth to Holyhead.
6. From Holyhead to the Scilly Islands.
7. From the Tweed to Cromer.
8. From Cromer to Dover.
9. From the Scilly Islands to Dover.

Ireland.

"10. From Malin Head to Roundstone Bay.
11. From Roundstone Bay to Bantry Bay.
12. From Malin Head to Dublin Bay.
13. From Dublin Bay to Wexford Harbour.
14. From Bantry Bay to Wexford Harbour.

"In each case the locality first named will be included in that section, but the second will not, the second locality being the starting-point for the next section."

This arrangement naturally results in brevity, and in something besides. The attentive reader will note that the Shetland Islands, for example, by this method are included both in sections 1 and 3; and that Dover is expressly excluded from both 8 and 9. What has Dover done to merit this treatment? It ought to be a "starting-point," and perhaps the authors think that Dover has reputation enough of the sort already. Similarly in Ireland, Malin Head is included twice (*viz.*, in sections 10 and 12), and Wexford Harbour is twice excluded (*viz.*, from 13 and 14), but then such things are as one expects them to be in Ireland. Brevity is thus well mated, and the authors may be pardoned their joke, though it needs so elaborate an explanation. At the same time, one cannot help thinking it would have been less amusing, but more scientific, to divide our coasts into something like natural areas, and to indicate them either symbolically or otherwise, but after an intelligible fashion. I may therefore be pardoned if I do not echo the authors' hope "that a foundation may thus be laid for working out the distribution of Marine Algæ on our shores." This system is surely enough for once, without experimenting on its possible developments.

There are two appendices—the first of species to be excluded, "since they have not been proved to grow on the shores of Britain." These are *Cystoseira barbata* C. Ag., *Laminaria longicruris* De la Pyl., *Sargassum bacciferum* C. Ag., and *Sargassum vulgare* C. Ag. On what shores, may I ask, has *Sargassum bacciferum* been *proved to grow?* It is a doubtful matter—perhaps on those mythical shores of Dover or Wexford Harbour. I agree to the exclusion of this visitor from "where the remote Bermudas ride," but for another reason. The second appendix of species that may be expected to occur on the shores of Britain, having been found on the Atlantic shores of France or of Norway, or in the Baltic, is certainly of express service to the collector. Apart from such matters (and this criticism of them I tender in the most friendly mood), Messrs. Holmes and Batters are to be heartily thanked for a solid and useful piece of work, which will bear fruit in many hands.

G. M.

ARTICLES IN JOURNALS.

Ann. Sciences Nat. (7th Ser., xii. 4–6 : Jan. 1891).—A. Garcin, 'Recherches sur l'histogénèse des péricarpes charnus' (4 plates).

Bot. Centralblatt. (Nos. 4, 5). — M. Leonhard, 'Zur Anatomie der Apocynaceen' (2 plates). — C. O. Harz, 'Ueber die Flora von Marienbad in Böhmen.'—(Nos. 6, 7). G. Kuntze, 'Zur vergleichenden Anatomie der Malvaceen.' — J. R. Jungner, 'Ueber die Papaveraceen im bot. Gart. zu Upsala nebst neuen hybriden Formen.'

Botanical Gazette (Jan.). — J. Donnell-Smith, 'Undescribed plants from Guatemala' (*Bocconia velutina*, *Chorisia soluta*, *Myrodia Guatemalteca*, *Heteropteris retusa*, *Potentilla Donnell-Smithii* Focke, *Tibouchina Bourgæana* Cogn., *Monochætum diffusum* Cogn., *Conostegia*

hirtella Cogn., *Miconia Guatemalensis* Cogn., *M. Turckheimii* Cogn., *Clidemia Donnell-Smithii* Cogn., *Passiflora clypeophylla* Mast., *P. allantophylla* Mast., *P. transversa* Mast., *P. ornithoura* Mast., *P. dicthophylla* Mast., *Melothria Donnell-Smithii* Cogn., *Anguria oblongifolia* Cogn., *A. diversifolia* Cogn., *Gurania Donnell-Smithii* Cogn., *Sicyos longisepalus* Cogn., *Cephaelis glomerulata* (tab. 1), *Daphnopsis Tuerckheimiana*, *Triuris brevistylis*, spp. nn.). — R. Thaxter, 'North American Hyphomycetes' (*Oedocephalum*, *Rhopalomyces*, *Sigmoidomyces* gen. nov.: 2 plates).—G. Vasey, *Sporobolus pilosus*, *Bouteloua uniflora*, spp. nn.—J. M. Coulter & J. N. Rose, *Actinella texana*, sp. n.

Bot. Zeitung (Jan. 30). — F. Kienitz-Gerloff, 'Die Protoplasma verbindungen zwischen benachbarten Gewebselementen in der Pflanze.'—(Feb. 6). M. Woronin, 'Ueber das "Taumelgetreide" in Süd-Ussurien.' — (Feb. 13). F. Buchenau, 'Ueber einen Fall der Entstehung der eichen blätterigen Form des *Carpinus Betulus*.'—(Feb. 20). H. Vöchting, 'Ueber die Abhängirgkeit des Laublattes von seiner Assimilations-Thätigkeit' (1 plate).

Bull. Soc. Bot. France (xxxvii. Comptes Rendus 5: Feb. 1).—D. Clos, '*Quercus fastigiata*.'—E. Roze, '*Urocystis Violæ* & *Ustilago antherarum*.' — P. Duchartre, 'Sur la production de caieux épiphylles chez le *Lilium auratum*.' — P. A. Gentz, '*Iberis decipiens* Jord. en Suisse.' — T. de Heldreich, *Centaurea redempta*, sp. n.— S. Pons, *Dianthus monspessulano-neglectus*, hybr. nov. — J. d'Arbaumont, 'Téguments séminaux des crucifères.' — —. Desvaux, 'Échanges gazeux d'un tubercule.' — Id., 'Atmosphère interne des tubercules.'— —. Clary, 'Plantes Oranaises.'—L. Mangin, 'Péronosporées recuillies aux environs de Paris.' — E. Prillieux, 'Sur les tubercules des racines des Légumineuses.'

Flora (Jan. 16). — C. Stich, 'Die Athmung der Pflanzen bei verminderter Sauerstoffspannung.' — A. Weisse, 'Ueber die Wendung der Blattspirale und die sie bedingenden Druckverhältnisse an den Axillarknospen der Coniferen' (1 plate). — F. Buchenau, 'Ueber Knollen- und Zweibelbildungs bei den Juncaceen.' — E. Loew, 'Ueber die Bestaubungseinrichtung und den anatomischeu Bau der Blüthe von *Oxytropis pilosa*' (1 plate).— H. Zukal, 'Halbflechten' (1 plate).—J. Müller, 'Lichenologische Beiträge.'

Gardeners' Chronicle (Jan. 31).—*Restrepia ciliata* Rolfe, sp. n.— (Feb. 14). *Schomburgkia Sanderiana* Rolfe, sp. n. — (Feb. 21). *Bulbophyllum inflatum* Rolfe, sp. n.

Journal de Botanique (Jan. 16). — E. Bureau & A. Franchet, 'Plantes nouvelles du Thibet et de la Chine occidentale' (*Clematis lancifolia*, *Meconopsis chelidonifolia*, *M. Henrici*, *Corydalis elata*, *Parrya ciliaris*, *Viola flavida*, *Silene platypetala*, *S. cæspitosa*, *Astragalus polycladus*, *A. tatsienensis*, *A. litangensis*, *Spiræa thibetica*, spp. nn.). — (Feb. 1). *Neillia thibetica*, *Rubus setchuenensis*, *R. xanthocarpus*, *Aralia angustifolia*, *Lonicera thibetica*, *L. trichosantha*, *Aster fuscescens*, *A. batangensis*, *Inula serrata*, spp. nn.). — (Jan. 16). E. Belzung, 'Diagnose microscopique de l'acide citrique.' — P. Hariot, '*Polycoccus*.' — (Feb. 1). C. Sauvageau, 'Sur la tige des *Zostera*.'

Journ. Quekett Microscopical Club (Jan.).—T. H. Buffham, 'On the reproductive organs of some Florideæ' (2 plates). — W. H. Shrubsole, 'A new Diatom from the estuary of the Thames' (*Streptotheca Tamesis*) (1 plate).

Midland Naturalist (Feb.). — W. Matthews, 'History of County Botany of Worcester' (contd.).

Naturalist (Feb.).—J. B. Davy, Lincolnshire Limestone Plants. —C. Waterfall, '*Carex montana* in Derbyshire.' — W. A. Shuffrey, 'Flowering Plants and Ferns of Littondale, Yorks.'

Oesterr. Bot. Zeitschrift (Feb.). — E. Heinricher, 'Eine Blüthe von *Cypripedium Calceolus* mit Rückschlagserscheinungen.' — J. Murr, 'Die Carex-Arten der Innsbrucker Flora.'— E. Hackel, 'Descriptiones Graminum novorum' (*Rottboellia glauca*, *R. geminata*, *Manisuris porifera*, *Andropogon impressus*, *A. Clarkei*, *Germainia Khasyana*, spp. nn.). — M. Willkomm, 'Neue & kritische Pflanzen der Spanische-portugiesischen und balearischen Flora' (*Carduus phyllolepis*, *Thymus Arundanus*, *Teucrium Reverchoni*, spp. nn.).— J. Freyn, 'Plantæ novæ Orientales' (*Hieracium Bornmülleri*, *H. cappadocicum*, *Phyteuma obtusifolium*, *Verbascum flavidum*, *Lamium setidens*, *Stachys odontophylla*, *Allium laceratum*, spp. nn.).

Pharmaceutical Journal (Feb. 21). — E. M. Holmes, 'Tu-chung Bark' (*Eucommia ulmoides* Oliv.).

Revue de Botanique (Jan.). — H. & A. Marcailhou-d'Aymeric, *Hieracium cryptanthum*, sp. n. — (Feb.). 'Henri de Puivert' (d. Jan. 16).—B. Riomet, 'Flore de la Thièrache.'

Revue Scientifique du Bourbonnais (Feb.). H. Gay, 'Synopsis de la flore de la Mitidja.'

BOOK-NOTES, NEWS, &c.

At the request of the Irish Land Commissioners, Mr. Carruthers is preparing a plain account of the potato-disease, with illustrations drawn by Mr. W. G. Smith, which will be reproduced in chromo-lithography as a wall-diagram for schools and farm-houses. A reproduction of Bauer's famous water-colour drawings of the germination of wheat, in the form of six wall-diagrams for educational purposes is being prepared under Mr. Carruthers' direction for publication by the Royal Agricultural Society; and we are glad to learn that this will be done at a price so low as to bring them within the reach of the poorest schools.

The series of British plants exhibited in the Botanical Gallery of the Natural History Museum has been extended by the addition of a series of British Mosses, consisting of 576 species arranged in 129 genera. The arrangement is that adopted by Hobkirk in the second edition of his *Synopsis* (1884), and the descriptions have been taken from that work. Great care has been exercised in the selection of the specimens. The exhibition of mosses differs from that of the flowering plants in the illustrations of the genera.

These come partly from Limpricht's *Laubmoose* (Band iv. of Rabenhorst's *Kryptogamen-Flora*), and partly from Bruch & Schimper's *Bryologia Europæa*. They show on an enlarged scale those parts of a moss which, owing to their minuteness, tend to escape notice. In genera where the natural habit is very marked, a representation of the capsule and its parts is alone given; but in most cases the portion of the stem which bears the capsule is also figured.

We have received the numbers for October to December last of *The Botanical Magazine*—not the work familiar for more than a century under that title, but a journal issued by the Tokyo Botanical Society, which is now in its fourth volume. The contents of the papers are for the most part known to us only from their titles, which are considerately printed in English as well as in Japanese; but some of the articles are given in both languages. Dr. Yatabe explains that, owing to the delay which has taken place in receiving answers from the European and American botanists he has consulted, he has determined to publish as new such species as he cannot determine with the means at his disposal, "without attempting in many cases to consult with European specialists." In the October number *Primula nipponica* and *Leptodermis pulchella*, in November *Primula tosaensis*, and in December *Kirengeshoma palmata*,—the last the type of a new genus of *Saxifragaceæ*,—are figured and described as new by Dr. Yatabe. The varied contents of the magazine and the large number of contributors speak well for the progress of Botany in Japan.

The *Bulletin of Miscellaneous Information*, 1890, issued in connection with the Royal Gardens, Kew, is an 8vo volume of 352 pages, published by the Stationery Office at the low cost of 2s. 10d. "Miscellaneous" the information certainly is, but much of it is of interest and importance. Among the papers is Dr. F. W. Oliver's "Report on Observations made on the Weather Plant" (*Abrus precatorius*): for the most part, however, they are connected with economic botany. One of the three Appendixes is devoted to a list of the plants which matured seed in Kew Gardens during 1889; a second list has just been issued as an Appendix for 1891, which is also stated to be for 1889: is not 1890 intended?

The *Bulletin* for January last is mainly devoted to a somewhat animated correspondence on the "production of seed and seminal variation in the Sugar-cane." Prof. Harrison, of the Government Laboratory, British Guiana, states, in no measured or halting language, his belief that the credit due to him and his colleague, Mr. Bovell, has been appropriated by Mr. Morris; and, in spite of Mr. Dyer's explanation, it is impossible not to feel that he has some justification for his complaint. It will be remembered that the investigations of Dr. Fressanges, which we printed in this Journal for 1890 (p. 303), were not referred to by Mr. Morris in his paper—a matter which, as we learn, has caused some unpleasant feeling in Mauritius; and *Timehri*, for June last, wonders "when justice will be done to the work of the colonial investigators." Those interested

further in the matter, which can hardly be allowed to rest here, will do well to invest twopence in the January number of the Kew *Bulletin*, and will then be able to form their own judgment on the points at issue.

Dr. Post publishes, in the *Quarterly Statement of the Palestine Exploration Fund* for January, an account of a trip to Palmyra, in the course of which he collected the new species enumerated in our last issue (p. 62), with a large number of others, of which a list is appended. Mr. Hart's volume on the *Fauna and Flora of the Wady Arabah* is announced as ready for publication.

Mr. W. H. Pearson asks us to state that the few Norwegian and Canadian specimens published in the last Fasciculus of Carrington & Pearson's *Hepaticæ Britannicæ Exsiccatæ* represent some extremely rare British species, such as *Gymnomitrium revolutum* N., *Jungermania saxicola* Schrad., *J. Kunzei* Hüben., *Harpanthus Flowtowii* N., of which there was little probability of British specimens being procured, although only sixty copies have been prepared.

The first part of an English edition of *Lindenia* has appeared, of which Mr. R. A. Rolfe is the English editor. The number contains four plates, and Mr. Rolfe is responsible for two of the descriptions —one of a new species, *Peristeria aspersa*, the other of a plant formerly referred to *Odontoglossum*, but now placed in *Cochlioda* (*C. Noezliana*).

The Herbarium of the late M. Triana, containing upwards of 8000 plants, has been acquired by the British Museum, as well as a large collection from the province of Atacama, Chili, made by MM. A. Borchers and F. Philippi, and determined by Prof. R. A. Philippi.

Mr. H. C. Hart has published in the *Proceedings of the Royal Irish Academy* (3rd Series, i. No. 4) a paper "On the range of Flowering Plants and Ferns on the Mountains of Ireland," in which he summarises the result of his seven or eight years' botanising in the Irish mountains. The information is given for the most part in tabular form, with observations upon certain species, and will afford valuable data for the new edition of the *Cybele Hibernica*.

Prof. Macoun is making rapid progress with his enumeration of Canadian Mosses, and will publish descriptions of the many new species in part vi. of his Synopsis of the Canadian Flora. The Mosses and Hepaticæ of Canada number at least a thousand species.

The Transactions of the Leicester Literary and Philosophical Society for January contains "A few notes on the Kew Herbarium," by the Rev. T. A. Preston. Mr. Preston incidentally refers also to the National Herbarium at South Kensington: but his remarks suggest the desirability of his obtaining more accurate and fuller information regarding this establishment.

We learn with regret of the recent death of Prof. Maximowicz, of St. Petersburg, which took place on the 16th ult.

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"There is no one who knew him with any degree of intimacy who does not feel that he has lost a personal friend, and that the world is the poorer by the death of Thomas Richard Archer Briggs. His humility, his single-heartedness, his great gentleness, his patient goodness, made his quiet influence a potent factor in every circle in which he moved." Such are the opening sentences of a brief "In Memoriam" notice which appeared in a weekly paper* published at Plymouth on January 31st. It is the Christian gentleman and the good citizen whose loss is there deplored; but very many—perhaps most—of the readers of this Journal will surely feel instinctively how true to the life must be this estimate of the man who was known to the majority of them only by his botanical writings. The few whose happy lot it was to enjoy his friendship cannot but be sorely pained at his sudden removal, nor fail to miss him grievously many a day. His powers of critical observation were so remarkable,—at once so acute and so discriminating,—his enthusiasm so real and his industry so unflagging, that such a thing as a hasty ill-considered judgment from him seemed always impossible. And his willingness to help was so unmistakeable, that one soon learned to trust him whenever he declined to give a positive opinion, acquiescing in the patience with which he was content to study and wait for light. Thus his place as a critical British botanist, and especially as a batologist, will prove hard to fill.

He was born on the 7th of May, 1836, at Fursdon, in the parish of Egg Buckland, near Plymouth. His parents were second-cousins, and his maternal grandfather, Major R. Julian, of Estover, had served in the American War of Independence, and was present with his regiment at Lexington and Bunker's Hill. Mr. Briggs was an elder son. His younger brother, Colonel J. A. Julian Briggs, survives him, and with his family occupies the old home at Fursdon, the house in which Mr. Briggs died on the 23rd of January. In 1844 or 1845 the family moved into Plymouth, with a view to the education of the children, the elder having proved too delicate to be sent from home. Even as a day boy his attendance at school was made irregular by his weakness of chest. It was not till about 1851 that he seems to have shown any special fondness for natural objects. At that time his cousin, the Rev. R. A. Julian, an enthusiastic naturalist, then at Cambridge University, was contributing some papers to the *Naturalist* on local Ornithology and Botany; and the sight of these seems to have suggested to the future botanist the idea of keeping a record of his own observations. For some years these notes were confined almost exclusively to Ornithology and Entomology, and it was not until 1858 and 1859 that they wore a decided botanical complexion.

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* *The Church in the West.*

His first published botanical notes appeared in the *Phytologist* from 1860 to 1862; his paper in the 1861 vol., "Dates of Flowering Plants in the Vicinity of Plymouth," giving good earnest of the patient and exact observation which was to be so characteristic of all he wrote. Equally interesting is it to note that even thus early, —some twenty years before the publication of his *Flora*,—the determination to observe and chronicle all that his neighbourhood could produce in the way of wild flowers seems to have been already formed. Even the limit "within twelve miles of Plymouth," which he ultimately adopted in his *Flora*, appears to have been virtually fixed by him as early as 1861, since it is in that year that we find his paper in the *Phytologist* on "Localities of some Uncommon Plants and Varieties of Common Species *within twelve miles of Plymouth*."

He was then twenty-five, and it is easy for those who have known him in later years to imagine the zest and enjoyment with which at that age he pursued his researches in every direction around Plymouth,—hindered as he was by his weak health from entering on any professional career, though happily not incapacitated for any amount of walking. Evidences of his activity and of the thoroughness of all he did are forthcoming in the unbroken series of papers and notes which appeared, first in the *Phytologist*, and then in its immediate successor, the *Journal of Botany*. And here perhaps I may be allowed to quote from a letter I have received from Mr. J. G. Baker:—"I made his acquaintance in the days when I managed the Botanical Exchange Club at Thirsk between 1860 and 1865. Watson, Syme, Trimen, Webb and he were the most active contributors; and when Trimen and I gave it up, he managed it to universal satisfaction for several years."

In June, 1862, he paid his first visit to London; but I have no particulars of it beyond the fact that he was much interested at finding two nests of the reed warbler in lilac-bushes in the Zoological Gardens. In November of that year he passed through a great sorrow in the loss of his mother, and early in 1863 himself underwent a bad attack of inflammation of the lungs. By July, however, he had sufficiently recovered to be able to accompany a friend of his father's to Malvern, Worcester, Hereford, and South Wales,—probably the most extended tour that he ever took. His industry as a field botanist had already been rewarded by the discovery of several plants not previously recorded from Devon, including *Tillæa muscosa* and the then little-known *Epilobium lanceolatum*. But in 1864 the addition to the British Flora through him of a most interesting species, *Hypericum undulatum* Schousb. (*H. bæticum* Boiss.) was announced by Briggs himself in this Journal, where soon after it was fully described by Prof. Babington, and a figure of it given.*

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* Later in the same vol. of the Journal (pp. 279—80) appears the following note:—"*Hypericum undulatum* found in Cornwall. — Mr. James Cunnack, of Helston, Cornwall, has found this plant abundantly in bogs near that town, and he has known it, but not by name, for several years. A botanical correspondent told him that it was *H. perforatum*, and he therefore has lost the

It was in this year also that he appeared for the first time as a lecturer at the Plymouth Institution, a Society where weekly lectures and discussions have for a long time past brought together most of the scientific and literary men of the neighbourhood. He was a member before this, and had furnished the botanical curator, Mr. I. W. N. Keys, with notices of rare plants. He had also presented to the Museum a number of eggs of Devon birds, mostly collected by himself. "Notes on the Flowering Plants in the Neighbourhood of Plymouth" was the title of his first lecture; and it was followed by a second series of similar "Notes" in the next session. His connection with the Institution was uninterrupted from this time, and was especially close for several years after the delivery of these first lectures. Thus in 1865 he was elected "Curator of Zoology"; in 1867 he lectured on the small birds of the neighbourhood, and in 1868 and following years on the Flora of Plymouth, its soil, its natural features and climate, and the distribution of its plant species. In 1869 he was also appointed Librarian of the Institution, and this office he held for a long time, giving much attention to the care and arrangement of the books.

Mr. John Shelly, of Plymouth, a prominent member of the Institution, to whose kindness I am chiefly indebted for these particulars of my friend's connection with it, has also been so good as to furnish me with the following reminiscences:—"I was much interested at this time in the dialect of S. Devon and E. Cornwall, and he often sent me notes of words and phrases and local pronunciations that he had met with. He was thoroughly acquainted with the Devonshire dialect, and would sometimes read stories in it at Penny Readings with a great deal of quiet humour. I remember his sometimes writing letters in the dialect to the local newspapers, under an assumed name, on the mischief done by the ruthless rooting up of plants from the hedgerows, and the destruction of small birds. He took a class in the Boys' Sunday School, and was a most diligent and successful teacher, winning the respect and affection of the boys, and retaining it long after they grew up and left the school. He was also much interested in the day schools, and took part in their management. After he left Plymouth," to occupy again the old home, Fursdon, Egg Buckland, "he became a lay reader in the parish, and I often heard of his good work there, especially as a teacher and visitor. . . . In all his work he was exact, punctual and diligent, always to be depended upon for the performance of anything he had undertaken. And he was always most considerate for others, with a rather formal old-fashioned courtesy that was very pleasant and winning."

These reminiscences of Mr. Shelly's are so entirely in keeping with my own (referring chiefly to later years), that I have not been able to deny myself the pleasure of quoting them.

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chance of being the first recorder of it, as a native of Britain.—C. C. B." Perhaps I ought to add that I have a specimen of it collected by myself in July, 1857, in Treverry Bog, near Helston, which I then mounted *unnamed*, because I could not match it with any described species in Bab. Man. of that date.—W. M. R.

It was not till 1876, four years after he had been elected a F.L.S., that I made Briggs' acquaintance. I was then moving from Wilts into Devon, and in the spring I wrote to him simply as a brother botanist, asking him if he would like a ramble with me on Dawlish Warren, where I had just seen *Romulea Columnæ* in good quantity and beautiful condition. We enjoyed two or three hours of a bright May day together; and the acquaintance thus begun quickly ripened into a warm friendship which I reckon among the choice blessings of my life. He was then living in Plymouth with his father, who was a great invalid for some years before his death, tenderly nursed and cared for by his son, who latterly quite refused to leave him for more than a few hours at a time. It was not therefore until after his father's death, in 1877, that I induced him to come and spend a few days with us at Trusham, near Chudleigh, in the Teign Valley, where I found myself in a most interesting botanical district. But this proved the first of a series of annual visits to my house, paid, I believe, without intermission for fourteen successive years,—up to last July. He usually came on a Monday; and we rarely succeeded in keeping him beyond the end of the following week, as he found it difficult to get a substitute to whom he could entrust his Sunday Bible-classes. This "parson's week," spent by a layman in a parson's house, was always devoted to botanical research and study,—almost wholly by him, and by me so far as my other engagements and duties would allow. He was always a very early riser, and eager (I like to believe) to begin his holiday, as we were always to receive him and share it, he used readily to fall in with my suggestion that he should travel by an early train, so enabling me to meet him in time for some hours' botanising on the road the first day of his visit. I need hardly say that there was a considerable addition to my knowledge of the flora of my own neighbourhood as an unvarying result of every such visit. His untiring industry never ceased to surprise me. Nearly always the first in the house to get downstairs in the morning, he frequently took an hour's ramble before our fairly early breakfast; and half an hour afterwards he was always ready to start for as long a day out as I chose to accompany him in, or spare him for. When he went alone, he seldom failed to bring back a full vasculum, as, in addition to such specimens as he thought I might like to preserve, he usually had several little bundles of vouchers of other plants to be looked through after his return to the house, before he would trust his memory to record them. The greater part of the evening was usually spent in this way, sorting, examining, discussing and disposing of the day's spoils before bed-time; and he always preferred returning home in time for this, so as to make each day's work complete in itself.

Keen as was certainly his enjoyment of this botanical routine in a district more or less new to him, he was always ready to have it broken in upon by a social gathering of parishioners, or other parochial entertainment or function in which he could take a part. And on such occasions his intimate knowledge of country life and his warm sympathy with the employments and anxieties of country

folk made him always both an interested and a helpful member of the party. In fact, he was so essentially unselfish, and so truly eager to be helpful to all with whom from any cause he came into close contact, that the social instinct was, I should say, always strong in him, however engrossing his personal studies or employments might seem to be.

Towards the end of 1877 I spent a night at his house in Plymouth, and he then showed me a considerable part of his Flora already in MS. But he never allowed himself to be hurried in his work, and he was especially anxious to do all he could with the *Rosæ* and *Rubi* of the district before he went to press. *Rosæ* had attracted him greatly, and so he had especially enjoyed and valued the frequent companionship of Mr. J. G. Baker during a month that he had spent at Plymouth; and now, after a lengthened correspondence with him and with the late M. Déséglise, he had to a great degree mastered this difficult genus, so far as it is represented in S. Devon and E. Cornwall. Even so far back as 1869, when Mr. Baker read his Monograph on the genus to the Linnean Society, we find him saying, "For a liberal supply of specimens I am indebted to Mr. T. R. Archer Briggs"; and he specially mentions specimens from him under *R. tomentosa*, *R. micrantha* var. *Briggsii*, several *canina* forms, and *R. bibracteata*. As one of the latest fruits of Briggs' close study of this genus we find him reading a paper on "The Roses of the neighbourhood of Plymouth" before the British Association when it met at Plymouth in August, 1877. After this his interest in the genus seemed rather to flag, and two or three years ago he insisted on handing over to me his entire collection of rose specimens, British and foreign.

His work on *Rubi* was necessarily extended over a much longer period. He had had the great Swedish batologist, Areschoug, botanising with him in the Plymouth neighbourhood, and with him, as well as with Prof. Babington and Dr. Focke, he had been in frequent correspondence for many years before I knew him. And he had already contributed some interesting papers on the genus to this Journal, as *e. g.*, "Stations of and Notes respecting some Plymouth Rubi" in 1869, and on *R. ramosus* Blox., *R. adscitus* Genev., and *R. mutabilis* Genev. in 1871; while in the 1869 vol. the Rev. A. Bloxam had described and figured under the name *R. Briggsii* Blox. a new form which Briggs had found near Plymouth. So it was a great pleasure to my friend to find during his first visit to me at Trusham that several of the rarer *Rubi* of his own neighbourhood,—including *imbricatus*, *ramosus*, *erythrinus* (already carefully discriminated by him, though not yet named), *adscitus*, *silvaticus*, and *longithyrsiger*,—occurred here and there in the Teign Valley also, though Dartmoor and a wide tract of country intervened. The keenness of his interest in this genus continued and even increased up to the last; so that *Rubi* always had the place of honour in our rambles, and were the chief subject of our correspondence.

In March, 1878, he left the house in which his father had died the previous year, and took up his residence with his brother, who had

now retired from the army, and for a time lived with his family in Plymouth; until, a few years later, they all moved together to Fursdon. This was a most satisfactory change in every way, and confirmed Briggs in his disinclination to leave home for more than occasional short visits to his friends; so that there were probably many years between 1878 and 1890 in which he did not spend a single night from home, except for his one visit of twelve or thirteen days to my house. Hence his brother, writing to me from Fursdon, says, "The periods of his life spent away from this neighbourhood might almost be counted in weeks, and the intense love which he had for this spot must be well known to you. I well remember the joy which he expressed when matters were so arranged that it became possible to move to Fursdon." His longest journeys from Plymouth, besides the one mentioned above to Malvern and South Wales, were to Kew and London for two or three short visits (during one of which he had the pleasure of spending some hours at Thames Ditton with H. C. Watson, with whom he had long been in correspondence), and westward to the Lizard, Penzance, and the Scilly Isles. This limited range of experience as a field botanist, while it enabled him to master more completely whatever there was to be learnt about the plants of the south-west of England, inevitably had an unfavourable effect on his knowledge of the British Flora as a whole, and so makes only the more remarkable the work he did as Curator of the Botanical Exchange Club, and the position he justly held as an authority on British plants generally.

At length, in 1880, his *Flora of Plymouth* appeared. The highly appreciative and yet eminently just review* of this work which appeared in this Journal at the time of its publication leaves little that is worth saying on the subject here. Never, probably, has so high an estimate of a work been more completely justified by the after-consensus of competent authorities. Two facts familiarly known to most of us are sufficient evidence of this;—I mean, the extent to which this work is still accounted the pattern volume for the best local Floras since published, and the circumstance that it continues in itself so full of interest to the general student, that he may turn to it now and open it almost anywhere with the certainty of coming on matter which will help or quicken him in his own researches.

Early in 1882 I left Trusham for Bridgerule, in North Devon, and here in brief visits in four successive years Briggs helped me to botanise the Upper Tamar Valley and neighbouring districts, as at Trusham he had helped me in the Teign Valley. In fact, in both neighbourhoods he went further afield than I was able to do; and the papers which I published in this Journal, in 1882 and 1886, on their floras would probably never have been written but for his help and encouragement; though, very characteristically, he steadily declined to join me in their actual preparation for the press, while taking the liveliest possible interest in their production. In this part of N. Devon the *Rubi* showed less affinity with those of

* *Journ. Bot.* 1880, pp. 281—285.

Plymouth than we had observed in the Trusham neighbourhood, and the flora altogether was poorer. But we were able to explore further, and he was especially interested in tracing the extension of *Hypericum undulatum* northward and eastward in the county. This species we had searched for in vain in the Teign Valley, and so Briggs' own stations at Ivybridge were the most eastwardly yet known in Britain. In the Upper Tamar Valley it proved much commoner than about Plymouth, and we traced it thence as far eastward as the moors about Dunsland Cross,—nearly in a line, I should suppose, with Ivybridge in the south. It has also been found in good quantity about Bideford, further north; but eastward from these three points it is still, I believe, unknown.

In 1883 he visited the Rev. R. P. Murray, who then lived in Wells, and with him made excursions in several directions, expressly for the purpose of examining the *Rubi* of the county. The assistance thus obtained from him is gratefully acknowledged by Mr. Murray in his "Notes on Somerset *Rubi*" contributed to this Journal in 1886. But this was not the only fruit of Briggs' intercourse with Mr. Murray in 1883. From his paper, "*Lobelia urens* L. in Cornwall," printed in this Journal at the end of that year, we learn how, acting on information received from Mr. Murray, he made his memorable expedition into E. Cornwall in search of this plant, and to his "great delight" (as he says), found it there in fair quantity "in two places about a couple of miles apart," on the moors between Lostwithiel and St. Veep.

His visit to Bridgerule in 1884 was later in the year than usual, and so he came in for a share in our Harvest Thanksgiving festivities; and at one of our parochial evening gatherings in the school-room he delivered a lecture on "Thomas Tusser, Farmer, Poet and Musician, of 300 years ago." He had been very sceptical as to his power of interesting a purely agricultural audience, such as alone I could there bring together. But, I am thankful to say, he had no reason to complain of their lack of attention; and the more intelligent of them, at all events, were gratified by a form of entertainment of which they had had no previous experience.

The readers of this Journal will hardly need to be reminded how continuous and varied was the stream of his contributions to its volumes from the first. These contributions are in the hands of all; but such papers as his "Queries in Local Topographical Botany," read at the Plymouth Athenæum, are not likely to be so generally known, and a brief quotation or two from these may perhaps be excused here.* Thus, in the first of these two lectures, in the course of some remarks on *Stellaria Holostea*, he writes (after reference to its dislike to limestone):—"By the road between Laira Bridge and Elburton, a distance of two miles over limestone, the plant occurs only in one or two partially shaded spots; and nowhere between Laira Bridge and Plymstock, so far as my observation goes. The fact that it does not refuse to grow on limestone, if shade and shelter are present, seems to favour the idea that it is the dry

* [They are referred to in this Journal for 1882, p. 376.—Ed. Journ. Bot.]

nature of the rock, and not its composition (in other words, its *lithological* rather than its *chemical* properties), that makes the plant avoid it. The power of a certain kind of rock in absorbing, retaining, or parting with moisture would seem to have much more to do with determining the character of the vegetation on it than has its chemical composition."

The following extract is from the second of these lectures:—"*Pimpinella magna* L. affords a remarkable instance of what appears arbitrary range in Devon and Cornwall. . . . Around the town of Plymouth it is a very abundant species, so that literally cart-loads might be collected in July and August in the parishes of Egg Buckland and Plympton St. Mary; but proceeding in a northerly direction, it becomes uncommon between Tamerton Foliott and Buckland Monachorum, and I have not met with it in any part of Devon north of this latter parish. East of Plymouth it is common on to at least the portion of the Erme basin lying south of Ivybridge. . . . . Across the Tamar, and so in E. Cornwall, it occurs in certain spots in the parishes of Maker, Rame, Antony, St. Johns and St. Stephens, also in the grounds at Pentillie; but beyond these parts I have never come across it in the whole county of Cornwall, though Watson does give it as a West Cornwall species on the authority of Dr. Oliver. It is unrecorded for N. Devon and the whole county of Somerset, but re-appears in many places in the kingdom, reaching Norfolk and West Perth, so that climate cannot have anything to do with its circumscribed range in the south-west. In the district around Plymouth it seems an increasing rather than decreasing species. It seeds abundantly, and has a remarkable power of quickly sending up flower-stems when the earlier ones are cut off by the hedger's hook; these in mild seasons will sometimes be in flower so late as November or December. It might be yet more plentiful with us if a small lepidopterous larva did not form a canopy of the umbels, by drawing their unopened flower-buds together with silky threads, to find within a dwelling and supply of food at the same time."

It might be tedious to enumerate even the chief of his very numerous discoveries in local botany, as announced from time to time in the Botanical Exchange Club Reports and in the several volumes of this Journal; but a list of the species and chief varieties added to the Flora of the British Isles through his researches would seem not out of place here. I am much indebted, as primarily, to Colonel Briggs for much varied information, so also to Messrs. Arthur Bennett and J. E. Bagnall for many notes and verifications of references bearing on these from books not in my library. These new species and varieties are, so far as I have been able to ascertain, as follows:—

Brassica Briggsii H. C. Wats. (Journ. Bot. 1872, 265–6; 1881, 360–2).
Viola permixta Jord. (B. E. C. Rep. 1864, 1865; Journ. Bot. 1866, 73).
Hypericum undulatum Schousb. (Journ. Bot. 1864, 45–6).
Rubus opacus Focke (Fl. Plym. 111, under *fissus*; Journ. Bot. 1890, 100).

R. erythrinus Genev. (Fl. Plym. 112, under *Lindleianus;* Journ. Bot. 1890, 102, 204).
R. Dumnoniensis Bab. (Journ. Bot. 1890, 338–9. *? R. rotundatus* P. J. Müll.; Journ. Bot. 1890, 129).
R. ramosus Blox. (Fl. Plym. 114; Journ. Bot. 1871, 330–2).
? R. hirtifolius Müll. & Wirtg. (Fl. Plym. 116).
R. silvaticus W. & N. (Fl. Plym. 118, under *villicaulis;* Journ. Bot. 1890, 130, 274–6).
R. adscitus Genev. (*R. micans* G. & G.; Journ. Bot. 1890, 130; Fl. Plym. 118; Journ. Bot. 1871, 366–8).
R. Boræanus Genev. (Journ. Bot. 1890, 131).
R. Anglosaxonicus Gelert. (Journ. Bot. 1890, 132).
? R. debilis Boul. ("*R. scaber*" of Fl. Plym. 123; Journ. Bot. 1886, 229).
? R. rhenanus P. J. Müll. (*R. Bloxamii* of Fl. Plym. 122, and *R. thyrsiger* Bab. of Lond. Cat. ed. 8; Journ. Bot. 1886, 226–7; 1888, 379).
R. Briggsii Blox. (Journ. Bot. 1869, 33).
R. mutabilis Genev. (Journ. Bot, 1878, 143–4).
Rosa micrantha Sm., var. *Briggsii* Baker (Fl. Plym. 135–6).
R. leucochroa Desv. (Fl. Plym. 141–2).
R. arvensis Huds., var. *Briggsii* Gaud. (Lond. Cat. ed. 8).
Pyrus latifolia Syme (Fl. Plym. 144–5; Journ. Bot. 1887, 208–9; 1888, 236–7).
P. cordata Desv. (*P. Briggsii* Syme; Fl. Plym. 146–7).
Rumex rupestris Le Gall. (Fl. Plym. 293–4).

Of these twenty plants added, as I believe, through Briggs to the British Flora, there are three,—the *? Rubus debilis*, *Rubus Briggsii*, and var. *Briggsii* of *Rosa arvensis*,—to which he himself, I know, attached but little value. The rest will probably maintain their position as species or varieties distinct from any others in our list; though possibly the nomenclature may have to be changed in two or three instances. If the list is incomplete, or contains any mistakes, I shall be grateful for corrections from any quarter.

Little remains to be said of the "life." The closing years, like those which preceded them, were years of ceaseless activity and untiring good work for others. The garden at Fursdon was a great interest to him, and his love of plants and birds a source of continual pleasure; but his work for the lads of the parish and for his poorer neighbours generally was what occupied him most; all else being entered into and enjoyed keenly and thoroughly indeed, but still more and more as recreation rather than as his life-work. There was no very marked decline of his physical strength; but for some years his eyes had become increasingly weak, so as at times to interfere rather seriously with his work; and in general look and bearing we, who only saw him at intervals, had come to think that he was aging rather rapidly, in spite of his continued power of walking and enduring fatigue.

His four last visits to us were paid at Bournemouth,—always between June and September. He was thus enabled to botanise

parts of the Isle of Wight, Hants, and Dorset,—in several instances with Mr. Mansel Pleydell and the Rev. R. P. Murray, and in 1889 with Dr. Focke, then staying with him at my house after they had been a few days together at Plymouth. It was partly owing to the exchange of views on *Rubi* which then took place that his correspondence on the genus with Prof. Babington and with me became fuller than ever, and especially during the past winter. These letters were continued to within a few days of his death, the illness which closed his life coming on suddenly and proving very brief. His last Sunday, Jan. 18th, he spent as usual, going to church twice and taking two Bible-classes; but that evening he complained of the cold, and as the week advanced he became seriously unwell. Not until very early on Friday morning, however, was his illness thought dangerous; severe inflammation of the lungs had then set in, and before eleven o'clock that night he had passed peacefully away. On the following Wednesday his body was laid to rest, not in the family vault in the church, but, at his special request, in an ordinary grave in the Egg Buckland Churchyard. Preaching on the loss the parish had sustained by his death, the vicar said of him:—"He made it his pleasure, through cold and darkness, in health or weakness, to soothe and comfort the aged on their way to the grave, as well as to help childhood to enjoy brightness and innocent pleasure at its outset on the thorny path of life. Ever ready to aid in all good works and to partake in the rational amusements of our people, he spared not himself in order to help others; doing all as in the presence of God, whom he served so faithfully. Innumerable little acts of charity will be missed, acts of which the world knew nothing, and of which even we his fellow-labourers were ignorant until some accident of time or circumstance revealed them to us."

W. Moyle Rogers.

TWO NEW CRYPTOGAMS.

By C. H. Wright.

Polytrichum (Pogonatum) **nudicaule** C. H. Wright. — Dioicous. Stem of male plant simple, of female fasciculately branched above, about 20 cm. high, the lower part not furnished with leaves or scales, quadrangular, angles very prominent when dry. Perigonial leaves ovate-cuneate. Leaves densely imbricate, slightly crisped when dry, lanceolate from a slightly sheathing base; margin serrate; lamellæ nearly covering the upper surface of the leaf, and consisting of three or four rows of cells placed vertically, the upper row slightly enlarged; nerve prominent beneath, and furnished with spines near its apex; areolation quadrate above, oblong at the base. Fruit terminal on the branches. Vaginula prominent. Calyptra campanulate, densely hairy. Seta 15 mm. long, reddish. Capsule erect, or slightly inclined, cylindrical, not striate, nigrescent; peristome-teeth 32; operculum subulate.

Hsingshan, Hupeh, Central China. Coll. Dr. A. Henry, Sept. 8, 1888, No. 6840.

A robust species, allied to *P. cirrhatum* Sw. and *P. macrophyllum* Dozy et Molkb., but differing from both in its more compact habit, fasciculate branching, complete absence of leaves on the lower part of the stem, and non-striated capsule.

Kantia vincentina C. H. Wright. — Cæspitose, æruginous. Stem prostrate, 1–2 in. long, without ventral flagellæ. Leaves incubous, subhorizontal, nearly opposite, ovate-falcate; apex more or less recurved, bidentate; cells rather large, irregularly hexagonal. Stipules distant, orbicular, bifid; lobes more or less toothed.

St. Vincent, W. Indies. On rocks, or rotten wood in damp ravines below 1500 ft. Coll. Herbert H. Smith, No. 1389.

Allied to *K. trichomanis* Gr., from which it differs in the leaves being longer, and more deeply dentate.

NEW FERNS FROM WEST BORNEO.

By J. G. Baker, F.R.S.

A small packet of Ferns recently received at Kew from the Bishop of Singapore and Sarawak contains the following novelties :—

30.* **Lindsaya** (Isoloma) **trilobata,** n. sp. — Rootstock short-creeping. Fronds dimorphic. Sterile frond with a slender naked stipe varying in length from 1 to 4 in. Frond deltoid, subcoriaceous, glabrous, 1–1½ in. long, tripartite, with an obovate-cuneate terminal lobe slightly repand in the upper half, and two shorter side lobes, produced on the lower side. Veins immersed, obscure, flabellate, anastomosing. Fertile frond with a lanceolate terminal segment. Sorus running down both sides of the terminal segment from the apex nearly to the base. Inner valve of the indusium narrow, glabrous, coriaceous.—Niah, Sarawak, *Mr. Chas. Hose*. Allied to *L. cordata* and *Gueriniana*. Another plant, seen only in a sterile state, is probably either a more compound variety of the same species or a near ally.

41.* **Nephrodium** (Lastrea) **polytrichum,** n. sp.—Rootstock not seen. Stipe stout, 1½–2 ft. long, densely clothed from base to apex with large spreading lanceolate-acuminate brown paleæ. Frond oblong-lanceolate, bipinnatifid, 3–4 ft. long, 2 ft. broad, moderately firm, pubescent all over beneath; rachis destitute of paleæ, except a few in the lower part. Pinnæ lanceolate, sessile, patent; lowest the largest, a foot long, 1½ in. broad, cut down to a narrow wing into entire linear-oblong segments ⅙ in. broad. Veins simple, 15–20-jugate, arcuate, distinct. Sori placed on the veins nearer the midrib than the margin. Indusium small, fugacious. Luigga Mountain, Sarawak. A very fine large species near *N. crassifolium* and *Leprieurei*.

130.* **Polypodium** (Eupolypodium) **barathrophyllum,** n. sp. —Rootstock erect. Stipes tufted, very short. Frond lanceolate,

simply pinnatifid, thick, flexible, glabrous, a foot long, ½–¾ in. broad, narrowed gradually to the base and apex, cut down to a narrow wing into entire linear-oblong lobes $\frac{1}{12}$ in. broad above the dilated base. Veins quite hidden and immersed. Sori medial, globose, 6–8 in a row on each side of the midrib of the lobes, sunk in very distinct round pits, which do not show as papillæ on the upper surface of the frond.—Mount Niulu, Sarawak, *C. Hose*. Allied to *P. khasianum* and the West Indian *P. inæquale* Fée.

4.* **Meniscium stenophyllum,** n. sp. — Rootstock short-creeping, ⅙ in. diam. Fronds dimorphic. Stipe of the sterile frond slender, naked, 3–4 in. long. Sterile frond lanceolate, simply pinnate, 9–10 in. long, 1½ in. broad, firm, green, glabrous; rachis not at all scaly. Pinnæ sessile, 20–30-jugate, oblong, under an inch long, ¼–⅓ in. broad, obscurely crenate, truncate at the base, slightly auricled on the upper side. Veins very distinct, raised; main veins only $\frac{1}{12}$ in. apart; veinlets 2–3-jugate. Fertile frond with a much larger stipe and smaller pinnæ, with a considerable space between them. Sori globose, soon confluent.—A very distinct novelty. Special locality not stated.

1.* **Hemionitis Hosei,** n. sp.—Rootstock stout, short-creeping. Stipes naked, glossy, castaneous, ½–1 ft. long. Frond simple, lanceolate, subcoriaceous, glabrous, a foot long, 1½–2 in. broad at the middle, more or less rounded at the base. Veins fine, distinct, erecto-patent, anastomosing in the sterile frond mainly in the outer third, but in the rather narrower fertile frond, in which the slender sori are confined to a band ¼ in. broad, remote from both midrib and margin, they anastomose copiously.—Matang, Sarawak, alt. 1500 ft. Nearly allied to *H. lanceolata* Hook. 2 Cent. t. 55.

NOTES ON HIGHLAND PLANTS, 1890.

By the Rev. E. S. Marshall, M.A., F.L.S.; and F. J. Hanbury, F.L.S.

During last July we had nearly three weeks' collecting together, in the vice-counties of West Sutherland (108), East Sutherland (107), East Ross (106), Mid-Perth (88), and West Perth (87), to which we reckon Glen Falloch to belong. Leaving London, we made straight for Inchnadamph in West Sutherland. This place has an interesting limestone flora, remarkable for the low elevation to which decidedly alpine species descend; the high mountains near are, however, remarkably barren, and we did not see any of the alpine hawkweeds, even upon Ben More of Assynt, though time prevented our ascending to the top of the bare stony peak, or working all the cliffs of this great mountain. A day and a half at Lochinver barely gave time to explore the vegetation of the district. Several things of interest were gathered in passing, at Oykell Bridge and between Rosehall and Invershin. From Tain (East Ross) we made a driving expedition to Tarbat Ness, and explored the coast thence to Rockfield, returning to Loch Eye, a loch

with a broad, shallow, muddy margin, covered with vegetation, and which merits a more prolonged examination than we were able to give. The next locality visited was Crianlarich, in Perthshire, whence expeditions (unfortunately interfered with by bad weather) were made to Corrie Ardran, Glen Falloch, and Ben Laoigh. E. S. M. stayed on a little longer, gathering two curious sedges on a second visit to Corrie Ardran, and some brambles, roses, &c., to the E. of Crianlarich; and afterwards spent two days in Glen Lochay, which is well known as a rich locality.

As on former occasions, we have to express our thanks to Mr. Arthur Bennett, for kindly revising the list of "new records," as well as for critical assistance. Mr. Baker named some of the more doubtful roses, which were not always determinable with certainty, being collected in an immature condition. Prof. Hackel determined some of the grasses, and a few *Rubi* rest upon Dr. Focke's authority; the Revs. E. F. Linton, R. P. Murray, and Moyle Rogers, also gave valuable help in naming these and other plants, as did Mr. W. H. Beeby. Dr. Buchanan White has revised the more critical willows. *Epilobia* are mostly not included here, having been dealt with in a previous paper.

* denotes a new record (so far as is known to us) for the vice-county mentioned; † a form new to Britain.

Ranunculus Flammula L., var. *petiolaris* Lange. — Shore of Lochan Feoir, near Inchnadamph; well marked. A form which seems to connect this with the type occurs in another loch, descending from Glasven, at 1200 feet.—**R. Steveni* Andrz. (*teste* Beeby). Corrie Ardran, at 2500 feet; Coire Dubh Ghalair, Glen Lochay, at 2300 feet (88); it may prove to be far from rare. — *R. bulbosus* L. Sandy links, Tain (106).

**Nymphæa alba* L. Between Rosehall and Oykell Bridge (107).

Arabis sagittata DC. was found on rocks in Glen Falloch, at 2500 feet.

Cochlearia officinalis L. A large form, which appears indistinguishable from cultivated *littoralis* of the Lizard, occurs in rills, above 1500 feet, on Ben More of Assynt. It is certainly not the ordinary Highland *alpina*. — *C. danica* L. Muddy shores, Lochinver (108) and Tain (*106). Not quite like the south coast plant in habit, but the fruit is typical.

Helianthemum Chamæcistus Mill. Between Tarbat Ness and Rockfield. A rare species in the Northern Highlands, apparently.

**Polygala oxyptera* Reichb. Sparingly at Tarbat Ness, and abundantly in shell-sand of the coast, near Tain (106); a northern extension of its British range. Mr. Bennett refers this, which is hardly our normal form, to *P. vulgare*, var. *compactum* Lange (= *P. dunense* Dumort., *β. compactum* Bot. Tidsskr. 14, p. 121). The author describes that (*Danske Flora*, p. 708) :—" Stems many, short and collected together tuft-wise [?] (tueformigt samlede), the upper leaves often pubescent, flower-heads short and compact, the large sepals white with a green mid-rib, a little narrower and longer than the capsules." In our plant the mature capsules rather exceed the sepals, which are green, tinged with pinkish

purple; the petals are white (Hornbeck's dictionary does not give "tueformigt," so we are in doubt about the exact meaning). Lange places "*oxypterum*" as his first var. under "*vulgare*," and this comes next. *P. dunensis* Dum. is given under *P. oxyptera* by Nyman, and the Tain form is referable to that rather than to *vulgaris*, as a segregate. Prof. Lange asserts in a foot-note that "*Polygala* is neuter," and that therefore the feminine adjective as used by Linné cannot be retained. In point of fact, it is a Latin feminine word, used by Pliny as an equivalent for the πολύγαλον of Dioscorides; no such word as πολύγαλα is to be found in Liddell and Scott.—**P. serpyllacea* Weihe. Oykell Bridge (107).

Silene acaulis L., grows plentifully on limestone cliffs, three miles from Inchnadamph, between 600 and 800 feet.

**Cerastium tetrandrum* Curt. Tarbat Ness (106). — *C. arcticum* Lange! Very fine, at 2200 feet, on Ben More of Assynt; *C. alpinum* was not seen there.

Stellaria media Cyr., var. *neglecta* (Weihe). Ditch-side, Inchnadamph.

Arenaria norvegica Gunn. We re-discovered this in the West Sutherland locality, where it was first found by the late Mr. Gray in 1887, but had to use great care in taking specimens. One fine plant was met with in a dry watercourse, about 2½ miles from the original station. Though very near the Ribblehead *A. gothica*, it is thoroughly distinct from *A. ciliata*. Identical with the Shetland *norvegica*!

Sagina maritima Don. Tarbat Ness; the ordinary upright form of the southern coasts = *S. stricta* Fr.

Lepigonum salinum* Fr., var. *medium* (Fr.). Coast near Tain (106).—L. marginatum* Koch. Coast near Tain (106).

Montia fontana L., var. *minor* Gmel. Inchnadamph, Lochinver, and Tain.—Var. *rivularis* Gmel. Inchnadamph.

**Geranium pusillum* Burm. f. Coast between Tarbat Ness and Rockfield, in fruit (106); a northward extension of its British range; looking native.

Trifolium pratense L. A curious prostrate form, analogous to *T. arvense* var. *maritimum* Towns., occurs in shell-sand near Tain.

Anthyllis Vulneraria L., var. **Dillenii* (Schultz), grows sparingly at Tarbat Ness, and abundantly in shell-sand near Tain (106).

Lotus corniculatus L. A hairy state, towards var. *villosus*, was found near Rockfield; another, with flowers twice as large as usual, growing on limestone near Inchnadamph, is just Mr. Beeby's Shetland "*forma grandiflora*."

Astragalus Hypoglottis L. abounds about Tarbat Ness, and in shell-sand near Tain.

**Vicia angustifolia* Roth. Tain (106).—*V. Cracca* L. The pretty form *incana* Thuill. (var.) was met with on low cliffs between Tarbat Ness and Rockfield; it seems to be a state of exposed situations.

Prunus Padus L. is certainly native near Inchnadamph; there is no personal authority for 108 in Watson. — **P. communis* Huds. Native, between Rosehall and Oykell Bridge (107).

Rubus suberectus Anders. Glen Lochay.—*R. fissus* Lindl. Railway bank near Crianlarich.—*R. plicatus* Wh. & N. (*teste* Focke).

Railway bank near Crianlarich.; also between Rosehall and Invershin (*107).— *R. opacus* Focke? A stronger bramble, growing between Rosehall and Invershin, the petals of which are at first white, but fade to pale pink, and which appeared quite distinct when living, seems identical with a Kentish plant recently determined by Dr. Focke himself. — *R. villicaulis* Koehl. (*teste* Focke). Plentiful at Lochinver (*108). Between Loch Eye and Tain (*106). Glen Lochay (*88); "about our Bournemouth *villicaulis*" (Moyle Rogers). —**R. leucostachys* Sm. Between Rosehall and Invershin (107); a small and weak state. — *R. mucronatus* Blox. Between Rosehall and Invershin (*107); "good *mucronatus*" (Rogers); Tain (*106). "This is the regular Scotch *mucronatus*, which I have seen from Boswell-Syme; wonderfully unlike our Bournemouth plant." (*id.*). —*R. corylifolius* Sm. Near Invershin (107).

Rosa involuta Sm. Lochinver (108); Tain (*106); Glen Lochay.—Var. *Sabini* (Woods). Kyleskue.—Var. *Doniana* (Woods). Gravelly sand by Loch Assynt, Inchnadamph; "good *Doniana*" (Baker, *in litt.*). -- *R. tomentosa* Sm. A remarkable and pretty little rose was met with on the right-hand side of the railway, going from Crianlarich towards Luib, about half a mile before reaching the Benmore burn. It was gathered for an *involuta*-form, but Mr. Baker considers it rather *tomentosa*. Bush two feet high; flowers small, white; sepals very glandular and pinnate. Leaves very hairy on both sides and glandular below. — *R. canina* L., var. *dumalis* (Bechst.). Inchnadamph; Kyleskue; Crianlarich. — Var. *dumetorum* (Thuill.). Glen Lochay.—Var. *obtusifolia* (Desv.). Tain.—Var. *pruinosa* Baker. Lochinver.—Var. *aspernata* (Déségl.). Rosehall. — Var. *glauca* (Vill.). Crianlarich and Glen Lochay. — Var. *subcristata* Baker. Kyleskue and Inchnadamph; Invershin; Crianlarich. — Var. *Watsoni* Baker. Lochinver; Glen Lochay. — Var. *Borreri* (Woods). Invershin (a form with the upper surface of the leaves hairy).

**Cratægus Oxyacantha* L. Near Rosehall (107); looking native.

Saxifraga nivalis L. Cruach Ardran (88); Glen Falloch (87), at 2500 feet.—**S. stellaris* L. Roadside between Rosehall and Oykell Bridge (107). — *S. quinquifida* Haw. (*S. sponhemica* Gmel.). On limestone, about Inchnadamph, not in flower; descending to 600 feet.

Drosera anglica × *rotundifolia* (*D. obovata* Mert. & Koch). In a bog near Lochinver, with the parents, in plenty; we have no doubt of its being a hybrid.

Callitriche vernalis Kuetz. Ditch near Port Mahomack (106).— *C. hamulata* Kuetz., ascends to a small loch on Ben More of Assynt, at 2300 feet.

Epilobium angustifolium L. is native on the limestone near Inchnadamph; not personally authenticated for 108. — *E. obscurum* Schreb. Near Rosehall (*107); near Tain (*106).

Circæa alpina L. Frequent about Inchnadamph, varying much in size.

Anthriscus sylvestris Hoffm. is evidently indigenous and not uncommon in Sutherland.

Ligusticum scoticum L. Lochinver; abundant between Tarbat Ness and Rockfield (*106).

**Æthusa Cynapium* L. Waste ground near the station, Tain (106).

Caucalis Anthriscus* Huds. Near Tain (106); native.—C. nodosa* Scop. Coast between Tarbat Ness and Rockfield (106), native; only known before as far north as Banff.

[*Sambucus nigra* L., is frequently planted round houses in 106–7–8, but was nowhere seen wild.]

**Galium boreale* L. Near Rosehall (107).—*G. sylvestre* Poll.—On limestone, about Inchnadamph.

**Sherardia arvensis* L. Invershin (107).

Solidago Virgaurea L., var. *cambrica* (Huds.). Ben More of Assynt, above 2000 feet.

**Pulicaria dysenterica* Gaertn. Near Tain (106); native. Another extension northwards.

Anthemis tinctoria L. Railway bank, Invershin; doubtless a mere casual.

Matricaria inodora L., var. *phæocephala* Rupr. Lochinver, well-marked. A form nearer *salina* Bab. grows on the coast near Rockfield.

Cnicus heterophyllus Willd. Near Rosehall; no personal authority for 107.

**Carlina vulgaris* L. Coast near Rockfield (106); native.

Centaurea Cyanus L. Cornfields near Tain.

Lapsana communis L. This, in the south, is such a plant of gardens, hedge-banks, and waste ground, that it might be thought to have been originally introduced by human agency, as is alleged of *Capsella*, &c. This view is, however, contradicted by our finding it on limestone rocks near Inchnadamph, at least a mile from house or garden; as the species has no feathery pappus, it can hardly be otherwise than indigenous there.

Hieracium anglicum Fr. Inchnadamph and Lochinver.—Var. *longibracteatum* F. J. Hanbury. Frequent about Inchnadamph; far more so than the type.—*H. iricum* Fr. Inchnadamph, ascending to 1200 feet; very fine by the river side, above Lochinver.—**H. flocculosum* Backh., was gathered in Strath Bagastich, Altnaharra (108), in 1888, by F. J. H.—**H. sparsifolium* Lindeberg! Oykell Bridge (107); the form with blotched leaves ("f. *aberrans cruentata*" Lindeb. *in litt.*).—**H. Langwellense* F. J. Hanbury. Oykell Bridge, scarce (107).—**H. caledonicum* F. J. Hanbury. Grassy cliffs between Tarbat Ness and Rockfield, the locality exactly resembling the original station at Melvich (106).—**H. strictum* Fr. Oykell Bridge, in good quantity (107).—†*H. dovrense* Fr. Tain (106); a form differing from the type in having *glabrous* ligules. Identical with a plant from Strathy, W. Sutherland, so named by Dr. Lindeberg. A fine and well-marked species, well away from our other British forms. The leaves are firm, yellowish green, rather glaucous; the styles very faintly livid. It was in good quantity at the spot where we observed it.—*H. Eupatorium* Griseb. (*corymbosum* Fr.). Lochinver;

Glen Lochay. Besides the typical form with very dark styles, a yellow-styled one is fairly plentiful on the railway about Crianlarich. F. J. H. proposes to deal with various *Hieracia* found during the last few seasons in a separate paper, which he hopes to publish shortly.

Pyrola minor Sw. On Cruach Ardran (88), at 2500 feet; barren.

**Anagallis arvensis* L. Roadside near Rosehall (107).

**Gentiana Amarella* L. Sands near Tain (106).

**Myosotis repens* D. Don. Oykell Bridge, &c. (107).—*M. collina* Hoffm. Sandy fields near Tain (106).

Veronica serpyllifolia L., var. *humifusa* (Dicks.). Ben More of Assynt, plentiful at 2300 feet. With white flowers, on Cruach Ardran.—**V. persica* Poir. Frequent in fields near Tain (106).

Bartsia Odontites Huds., var. *verna* Reichb. Inchnadamph; Glen Lochay; in the latter station a very marked form indeed.—Var. *serotina* Reichb. Near Portmahomack (106).

Melampyrum pratense L., var. *montanum* Johnst. Near Inchnadamph; Glen Falloch; Glen Lochay.

Rhinanthus sp.? On the drive from Tain to Portmahomack we both noticed from a considerable distance a yellow-rattle which was new to us, and which, at the time, we supposed to be *R. major*. The flowers, however, will not do at all for that species, being no larger than in *R. minor*; nor does our plant seem to be *R. angustifolia* Ehrh., the distribution of which, also, renders its occurrence in North Britain rather unlikely. Variable as *minor* is, we do not believe the E. Ross specimens to belong to it. The root is stout; the stem profusely branched in its lower half, 1 to 1½ ft. high. Leaves erect, linear-oblong (rather recalling narrow-leaved states of *Epilobium adnatum* Griseb.). Upper bracts more "discolorous" than in normal *minor*. Unfortunately, it seems impossible to preserve the *facies* in this genus, but we hope to collect the form again, and submit it to good authorities in a living state.

Utricularia intermedia Hayne. Moorland pools above Crianlarich, at about 700 feet.

Pinguicula vulgaris L. A form approaching var. *bicolor* Nordstedt grows at the base of the lower cliffs on Ben Laoigh.

**Calamintha arvensis* Lam. Railway-bank, Inversbin (107); associated with *Anthemis tinctoria*, but very likely native.

Lamium intermedium Fr. Cultivated ground, Lochinver; abundant.—**L. purpureum* L. Inversbin (107).

Plantago pumila Kjellmann. Two specimens gathered on limestone near Inchnadamph, at 700 feet, appear quite identical with plants from Ben Hope, collected by Mr. Cosmo Melvill and F. J. H., except that the sepals are darker. A small plantain from the top of Cronkley and Widdybank Fells, Teesdale, does not differ in any point, so far as we can see; all three have the sepals ciliated. The Ben Laoigh form, mentioned by us last year, has a taller scape, and the leaves are less erect; but we had to leave the hill practically unworked, this time, owing to one of us being seized with a sudden chill. Mr. Melvill recently wrote as follows:—"Although it is dangerous, in our present knowledge of the

genus as touching British distribution, to call it anything else but *maritima* var., there are certainly some points about it that come very near *serpentina* Vill., in my opinion. I was looking at it again the other day."

Scleranthus annuus L., var. *biennis* Reuter. Sandy field near Tain. The type is frequent.

**Chenopodium album* L. Lochinver (108); the var. *viride* (L.).

Atriplex patula* L. Coast near Tarbat Ness (106).—A. Babingtonii* Woods. Lochinver (108). Mr. Bennett writes, of a plant which grew in company with this, but appeared very different:—"I thought at first this was *Babingtonii* var. *virescens* Lange, but the leaves are not *Babingtonii* at all; I have nothing to match it from Europe." Our visit was too early for getting really determinable specimens.

**Suæda maritima* Dum. Muddy coast near Tain (106).

**Rumex crispus* L. Invershin and Rosehall (107).

**Euphorbia Peplus* L. A weed at Lochinver (108).

**Ulmus montana* Sm. Clearly native near Rosehall (107), as well as around Inchnadamph.

**Myrica Gale* L. Altnagealgach, W. Ross (105).

Betula pubescens Ehrh., var. *carpatica* (Waldst. & Kit.) Regel. Islet in Loch Awe, near Inchnadamph.

Salix pentandra L. Lochinver, by a small woodland swamp; evidently indigenous.—*S. Smithiana* Willd. Coast near Rockfield; accidentally introduced? "Near *stipularis*, but verging to *sericans*" (B. White *in litt.*). Probably *cinerea* × *viminalis*.—**S. Caprea* L. Near Tain (106). A very old tree, growing on a streamlet about two miles from Inchnadamph, measures 9 feet 4 inches round at shoulder-height. — **S. phylicifolia* L. Glen Falloch (87), above 1000 feet.—*S. Arbuscula* × *herbacea* (*S. simulatrix* B. White). Cruach Ardran, at 2500 feet. Intermediate in characters, but rather towards *herbacea* in habit. It is only at this one spot on the whole hill-side that the two species occur together, and the evidence of hybridity is as strong as it can well be, in a wild plant. **S. aurita* × *cinerea* (*S. lutescens* A. Kerner). Oykell Bridge (107); both parents grow close by. Near Inchnadamph (*108). This will probably prove to be by far the commonest British hybrid; in W. Surrey it is quite frequent.—**S. aurita* × *repens* (*S. ambigua* Ehrh.). Near Inchnadamph, in two forms. Coast, Lochinver (108). Loch Eye. In each case growing with the two parents. — †*S. Myrsinites* × *phylicifolia* (*S. Normani* Anderss.). A single bush, overhanging the Allt Dubh Ghalair, Glen Lochay, at nearly 1700 feet. Gathered for a form of *phylicifolia*, but darkening as it dried. The name was suggested by Dr. White, who has not seen satisfactory specimens of Andersson's plant. The finder is quite convinced that this suggestion is correct, after very careful and repeated examination; there is no evident *nigricans* in the specimens, which are in capital order for determining. *Phylicifolia* grows in the valley below, and *Myrsinites* on the hill above.

Obs. *S. Myrsinites* var. *procumbens* (Forbes), recorded from Inchnadamph a year or two back, proves to be very abundant on

the limestone, between 300 and 700 feet; in one walk several hundreds of bushes were met with, whereas the species is usually quite alpine, and the plants few in number where it occurs. Although Dr. White cannot separate this as a permanent variety, it is very well marked in that locality; the large bright-green patches in the heather formed by single shrubs often measuring several feet in diameter. One plant was quite prostrate, with remarkably narrow and pointed leaves.

Juniperus communis L. A prostrate plant from the sandy links near Tain was gathered for *J. nana* Willd., of which it has the general look. But, on being placed side by side with the true plant from near Inchnadamph, a great discrepancy is at once visible. The coast plant has straighter, more slender, less rugged branches; leaves narrower, half as long again, and far less numerous, being straight and erect-patent, instead of densely imbricate and curved; fruit one-third smaller, with the blue "bloom" much less copious. On the whole, we think *J. nana* a fairly good species. We noticed it between Rosehall and Invershin (*107).

**Pinus sylvestris* L. Beyond question this is wild at Oykell Bridge, and on hill-sides between there and Rosehall (107).

Malaxis paludosa Sw. Kyleskue, and in a bog near Lochinver.

Listera cordata R. Br. Plentiful near the Allt Dubh Ghalair, Glen Lochay, from 1200 to 1500 feet.

Epipactis atro-rubens Schultz., from the limestone at Inchnadamph, is precisely identical with a Swiss plant gathered by E. S. M. in the Upper Valais, at about 6000 feet, in 1885.

Orchis incarnata L. About Inchnadamph, but very scarce; *O. mascula* L., which appears to be rare in the extreme north, was noticed in fruit on the limestone.—**O. latifolia* L. (segregate). Swampy ground of the coast, between Tarbat Ness and Rockfield (106).

**Habenaria bifolia* R. Br. Oykell Bridge (107). *H. chloroleuca* Ridley is more frequent in the Highlands than we had supposed; it was seen plentifully at Inchnadamph and Lochinver, as well as near Crianlarich, where some of the plants rivalled those of the Kent woods for size and beauty. In Scotland it is an ornament of open grassy meadows, &c.; in the south we chiefly know it as a woodland species.

Allium ursinum L. Inchnadamph; a slender form, very scarce.

Juncus castaneus Sm. Cruach Ardran, above 2500 feet.—*J. triglumis* L. Descends to 700 feet near Inchnadamph, as does *Tofieldia*.

Alisma ranunculoides L. Muddy shore of Loch Eye, in plenty.

**Potamogeton heterophyllus* Schreb. Loch Eye (106); a form verging towards *nitens* var. *curvifolius*.—*P. prælongus* L. A floating piece of a pondweed found at the "Gillaroo Loch," near Inchnadamph, probably belongs to this species.

Zostera marina L., var. *angustifolia* Fr. Muddy shore near Tain, flowering freely.

**Eleocharis uniglumis* Link. Abundant in a salt marsh, Tain (106).—*E. multicaulis* Sm. Loch Eye (106).

Eriophorum latifolium Hoppe. Frequent about Inchnadamph; also noticed near Oykell Bridge.

Carex rupestris All. Limestone cliffs, in a valley about three miles on the Altnagealgach side of Inchnadamph, in great abundance, at 600 to 800 feet. An interesting confirmation of Dr. Churchill Babington's record for W. Sutherland, where it does not seem to have been found for about half a century.—*C. limosa* L. In two bogs near Lochinver; evidently frequent in W. Sutherland. —**C. pallescens* L. Near Rosehall (107).—*C.* sp.? A small sedge allied to *panicea*, but more closely resembling *vaginata* in habit, is plentiful in wet spots in Corrie Ardran, from 1800 to 2400 feet. It has very dark (purplish black) glumes, their midrib occasionally excurrent, embracing the small (but immature) fruit. This is in cultivation, and has also been planted in a sphagnous bog in Surrey, to test its constancy. At present it looks like a good species or subspecies, nearest *panicea*. The *C. intermedia* Miégeville, recorded in 1889 from Fort William, has flowered very little in cultivation, but retains its wild habit.—**C. vaginata* Tausch. Glen Falloch (87). — **C. fulva* Good. Oykell Bridge (107). — **C. flava* L. In several places between Invershin and Oykell Bridge; the var. *Œderi* (Ehrh.) = *minor* Towns. — *C. flava* × *fulva*. Glen Lochay, with the parents, at 800 feet; a good-sized plant, but only bearing one spike. Owing to the close affinity of the species, and their frequent association, it is likely to prove common.—**C. chrysites* Link (*C. Œderi* auct. mult.). Abundant at the north end of Loch Eye (106); a strongly-tufted and handsome form. By Loch Assynt, Inchnadamph.—*C. vesicaria* L. A sedge found in Corrie Ardran at 2200 feet shows a decided approach to the Cheshire *involuta*, but the leaves are broader. Mr. Bennett would place them both under *rostrata* Stokes; but the Perth plant appeared, when fresh, to be a form of *vesicaria*, with longer heads than usual and semicylindric leaves, not glaucous as in *rostrata*, the glumes of the male spikelets also lacking the hyaline margin usually so noticeable in that species. Many of the glumes in the female spikelets have an excurrent midrib, but this point varies in the same head. While calling attention to this doubtful form, we hope to settle its proper place by another visit, when it is in more mature condition.

Phleum pratense L., var. *nodosum* (L.). Abundant and very characteristic among shell-sand of the coast, near Tain.

**Agrostis canina* L. Oykell Bridge (107).—*A. vulgaris* With., var. *pumila* (L.). Kyleskue, and near Tain.

**Ammophila arundinacea* Host. Coast near Tain (106).

Aira caryophyllea L. An intermediate state between the type and var. *multiculmis* (Dum.), found at Rosehall and near Tain, is believed by Prof. Hackel to be the var. *aggregata* of Syme and others. True *multiculmis* has much smaller spikelets, the flowers of the panicle more numerous, &c.

Deschampsia cæspitosa Beauv., var. *alpina* Gaud. Ben More of Assynt, at 2200 feet; Cruach Ardran, at 2700.—*D. flexuosa* var. *montana* (Huds.), also occurs in Corrie Ardran.

**Avena pubescens* Huds. Sandy links, Tain (106).

**Melica nutans* L. Wooded banks of the river, near Lochinver (108); very scarce.

**Poa nemoralis* L. Between Rockfield and Loch Eye (106). — *P. Balfourii* Parn. A grass rather frequent in Corrie Ardran, from 2000 to 2500 feet, and also occurring in Glen Falloch, is thus named by Prof. Hackel, who says:—"A pale-flowered form; also departing from the type in *frequently* having the stem-nodes not quite covered by the sheaths." It is very different from *P. glauca* Sm.—*P. cæsia* Sm. A plant grown in the garden at Witley from roots gathered by us on Ben Laoigh is so named by Prof. Hackel; it is clearly identical with wild specimens collected by E. S. M. in 1887 on Meall Garbh, Ben Lawers, which were passed as *P. Balfourii* by Prof. Babington, but which Dr. Hackel subsequently named *cæsia*. Both in a wild and cultivated state this is much taller than *P. glauca*, intensely (silvery) glaucous, and very beautiful; the spikelets are mostly on long stalks. It appears to be distinct from *glauca*, and is not improbably so from *Balfourii*.—*P. pratensis* L., var. *subcærulea* (Sm.). Tarbat Ness.—Var. *angustifolia* (L.). Near Inchnadamph, on limestone.

Glyceria fluitans R. Br. Ascends to 1200 feet in a loch near Inchnadamph.—Var. *triticea* Fr. Swamp by the Loanan, Inchnadamph. The description in Mant. ii. p. 7 is as follows:—"Rhizomate obliquo subrepente, panicula racemosa subsimplici, fructifera, spiciformi contracta, valvula late lanceolata acuta, *Herb Norm.* v. n. 92." This fits our plant well. Dr. Hackel says that it is "an inconsiderable variety"; but the specimens are sufficiently off type to have been named "var. *declinata* Bréb." and "*G. plicata* Fr., var. *subspicata* Parn." by good English botanists.

Festuca rubra L., subvar. *grandiflora* Hackel occurs in shell-sand near Tain. The var. *pruinosa* Hackel is plentiful on cliffs near Tarbat Ness; we suspect that it may be Smith's "*F. glauca*." Var. *fallax* Hackel (*F. fallax* Thuill.). Turfy wall-tops, Glen Lochay. A form gathered in Glen Nevis, 1887, by E. S. M., is quite the same thing. It is extremely unlike the true *F. heterophylla* Lam., with which it has been much confused. — **F. arundinacea* Schreb. Tain, and near Rockfield (106).

Agropyron caninum Beauv. A state with unusually long awns grows about Lochinver, and on the limestone about Inchnadamph. —*A. repens* Beauv., var. *Leersianum* Reicht. Tain. — **A. acutum* R. & S.? Coast near Tain (106); resembling specimens so named from Caistor beach, Norfolk, but not quite of so robust a habit. — **A. junceum* Beauv. Coast near Rockfield (106).

Hymenophyllum unilaterale Bory. Rocky bed of the burn in Glen Falloch, at 1300 feet.

Cryptogramme crispa. Glen Falloch and Cruach Ardran, at about 2500 feet in each case.

Asplenium marinum L. Tarbat Ness.

Athyrium alpestre Milde. Ben More of Assynt. Glen Falloch.

Woodsia hyperborea R. Br. Rocks in Glen Falloch, at 2500 feet; sparingly.

**Polystichum lobatum* Presl. Inchnadamph (108).

Lastræa Filix-mas Presl, var. *paleacea* Moore. Very well marked at Lochinver.—Var. *abbreviata* Bab. Ben More of Assynt, at 2200 feet; rather a depauperate alpine state than a variety.

Equisetum pratense Ehrh. Up to 2700 feet on Cruach Ardran; very much dwarfed.

Lycopodium alpinum L. A very marked form grows plentifully near the Allt Dubh Ghalair, at 1250 feet (88), among long heather, with *Listera cordata* and *Lycopodium clavatum*, which, from its extremely flattened branches, &c., was referred pretty confidently to *L. complanatum* L. Mr. H. Groves, however, disputes that naming, and he is correct, judging from a Norway specimen kindly sent by him. Whether we really have true *complanatum* in Britain at all seems somewhat doubtful.

Chara fragilis Desv. Near Lochinver.

Nitella opaca Agardh. Small loch near the inn, Kyleskue (108).

CARL JOHANN MAXIMOWICZ.

Dr. Otto Stapf contributes to *Nature* of March 12th an obituary notice of Maximowicz, from which we extract the following :—

Carl Johann Maximowicz, who died at St. Petersburg on February 16th, after a few days' illness, was born at Jula in 1827. He went early to St. Petersburg, where he was brought up. In 1844 he left the Russian capital for the University of Dorpat. After completing his studies, he was appointed Director's Assistant at the Botanical Garden at Dorpat, a post he held until 1852, when he was made Conservator of the Imperial Botanical Garden at St. Petersburg. The following year he set out on a voyage around the world on board the frigate 'Diana,' his chief task being to make acquisitions of living plants for the Botanical Garden at St. Petersburg. The 'Diana' visited Rio de Janeiro, Valparaiso, and Honolulu; but when war was declared by the Western Powers against Russia, she was compelled to call at the nearest Russian harbour, De Castries, on the coast of Mantchuria, at that time the youngest, and scarcely an organised, Russian colony. Maximowicz had to leave the frigate, and decided at once to go up the River Amur, and to explore its banks and the adjoining country, which was then little known. Though furnished with only limited means, he carried out his task, under great difficulties and severe privations, in a very successful manner. He returned to St. Petersburg by way of Siberia in 1857.

The next two years he devoted entirely to the working out of his *Primitiæ Floræ Amurensis*, which appeared in 1859, and contained a full enumeration of his botanical collections, and a most clear exposition of the general physical features of the country visited by him, and particularly of its phytogeographical character. Immediately after, the full Demidoff Prize was awarded to him in

acknowledgment of the excellence of his work. At the same time he was directed to proceed again to the far East.

In 1859 and 1860 he travelled in Mantchuria; in 1861 he visited the island of Jesso; 1862, Nipon; 1863, Kiu-siu. He returned to Europe by the sea route in 1864. It was then that he first visited England. He was at that time in a bad state of health, in consequence of an obstinate fever he caught in Japan, from the effects of which he suffered from time to time throughout his life. In 1869 he was appointed Botanicus Primarius at the Imperial Botanical Garden at St. Petersburg, and was also entrusted with the direction of the Herbarium of the Academy. After 1866 he published many contributions to the Flora of Eastern Asia in the Mémoires and Bulletins of the Academy, the most important being a monograph of the Rhododendrons of Eastern Asia, the *Diagnoses breves Plantarum Novarum Japoniæ et Mandshuriæ*, Decades i.–xx.; the *Diagnoses Plantarum Novarum Asiaticarum*, i.–viii., &c. It was in the latter that he began to work out the large and exceedingly important collections made by Prjevalsky, Potanin, &c., in Central Asia. In consequence, however, of the extreme thoroughness of his work, and his highly critical method, combined with overwhelming official duties, the first parts of these important works did not appear before the end of 1889. These are the *Flora Tangutica* and the *Enumeratio Plantarum in Mongolia lectarum*, each comprising only the *Thalamifloræ* and the *Disciflorae* of the collections.

A general review of the phytogeography of Central Asia, founded on the collections of Prjevalsky and other Russian explorers, was submitted by him to the Botanical and Horticultural Congress at St. Petersburg, 1884; it is a model of lucidity of style and arrangement. Maximowicz's preparations for the remaining parts were considerably advanced, and a large number of beautiful plates are ready for press. But we look in vain for the man in Russia who could take up the work. Deeply as we must regret that he was not permitted to finish his work himself, it is certain that whatever he completed will last. He was of a noble, high-minded nature, a highly cultivated scholar in almost every branch of learning, and a gentleman in the truest sense of the word.

SHORT NOTES.

Primula elatior Jacq.—I have a plant of this growing in a pot, and also one of *P. vulgaris:* this caused me to notice the development of the young leaves. I found a most marked difference between them when very young. Those of *P. elatior* are *transversely plicate*, so strongly as to show no connecting veins between the ridges; in *P. vulgaris* the leaves are conspicuously *reticulate-rugose* from the very first. As the leaves increase in size this difference becomes much less apparent, and does not attract attention. Unfortunately I have not a root of *P. veris* to examine on this point. I take advantage of this opportunity to notice a very

unfortunate mistake in my *Manual*. The capsule of *P. elatior* is described as "equalling" the calyx; it should be "exceeding" that part. The length is an important distinctive character of the *true* oxlip, *P. elatior*.—C. C. Babington.

North Wales Plants. — The following plants, not hitherto recorded, I believe, for the several counties named, were found in them, in the localities given, by my son, F. A. Rogers, and me last year:—

Carnarvon (Top. Bot. 49).—*Leontodon hirtus* L. Great Orme's Head.

Denbigh (Top. Bot. 50).—*Rosa micrantha* Sm. Trefnant.

Flint (Top. Bot. 51).—*Cerastium tetrandrum* Curt. Rhyl.—*Sagina apetala* L., *Rubus rusticanus* Merc., *R. saxicolus* P. J. Müll., *R. diversifolius* Lindl., *Salix aurita* L., and *S. repens* L., all Mostyn; and *Hypochæris glabra* L. Rhyl.

We also saw on Great Orme's Head *Rosa agrestis* Savi and *Avena pratensis* L., which are not given for Carnarvon in Top. Bot. ed. 2, but have, since its publication, been recorded for that county by Mr. Griffith.—W. Moyle Rogers.

East Kent Plants. — I have recently met with the following plants, not noted for this vice-county in *Topographical Botany*, but which have localities given for them in Mr. Hanbury's MS. notes for a Flora of the county; these are placed in square brackets:—*Fumaria Boræi* Jord. Field, Appledore. [Ashford, *Hanbury*].—*F. confusa* Jord. Field near Ham Street. [Ashford, *Webb*].—*F. muralis* Sonder. Hedge, Stourmouth. [Kennington, near Ashford, "*Herb. J. S. Mill.*"].—*Rubus rhamnifolius* Whe. & N. Preston, &c. [Several localities].—*R. leucostachys* Sm. Preston, Chilham. [Several localities].—*R. corylifolius* Sm. Ham Street, &c. [Many stations].—*Rosa agrestis* Savi ("*sepium*"). Borders of chalk-woods, between Chilham and Crundell. [Two stations, *Webb*, 1875; specimens in Herb. Brit. Mus.!]. My plants have the leaves hairy on both sides, and white flowers. — *Pyrus torminalis* Ehrh. Woods, Ham Street. [Near Tenterden, *B. D. Jackson*].—*Glyceria pedicellata* Towns. Chilham. [Three localities, *Hanbury* and *Webb*].

Among some brambles collected by me in this vice-county during the first week of July, 1890, the following appear to be novelties:—*R. opacus* Focke; near Preston. *R. rudis* Whe. (true); on both sides of the railway, just north of Ham Street Station. *R. viridis* Kalt.; woods near Ham Street. *R. scaber* Whe. & N.; Penny Pot Woods, between Chilham and Crundell (these four, through the kindness of Revs. W. Moyle Rogers and E. F. Linton, were determined by Dr. Focke). *R. Koehleri* Whe.; Penny Pot Woods. *R. macrophyllus* Whe. & N.; woods near Ham Street. *R. flexuosus* M. & L. (= *R. Güntheri*); ditto. *R. Balfourianus* Blox.; railway-bank, about a mile north of Ham Street Station.—Edward S. Marshall.

Juncus tenuis Willd. in Carnarvonshire. — On July 5th, last year, I was invited by Mr. E. Ll. Williams, of Dolbenmaen Garn, to accompany him to the Traeth Mawr, near Port Madoc, a large

tract of land reclaimed from the sea, to examine the place for *Juncus acutus* and *maritimus*. In the course of our walk I called my companion's attention to a *Juncus* that he was passing over, which was altogether different from any rush which I had before seen in a living state. Subsequent examination on Mr. Williams' part, Mr. J. E. Griffith's, and on my own, has shown that the plant is *J. tenuis*. The specimen which I cut agrees exactly with my continental specimens. This discovery led me to ask Mr. Williams to examine the Traeth for further tufts of this plant, and he has reported the discovery of three to me—all *small ones*. These were all in fruit, and he has kindly placed specimens of them at my disposal for distribution amongst the members of the Exchange Club for the British Isles.—W. H. Painter.

Hieracium argenteum Fr. in Merionethshire.— This *Hieracium* grows on some rocks on the Merionethshire side of the River Glaslyn, close to the railway from Port Madoc. It was pointed out to me by Mr. Williams on July 5th, and was sent by me to Mr. Hanbury, by whom it has been determined.—W. H. Painter.

European Aliens in America.—The interesting communication of Mr. Cockerell (p. 76) prompts me to record a fact that was mentioned to me during a short visit to Canada and the Northern United States in 1884, *viz.*, that the native and the imported forms of *Plantago major* are readily distinguishable from one another, and that the latter is known to the Indians under the name of "white man's foot." Of the species mentioned by Mr. Cockerell, those which I met with most frequently at that time in the Eastern States, especially in the valley of the Hudson, were *Chrysanthemum Leucanthemum*, *Plantago major*, *Chenopodium album*, and *Polygonum aviculare*; *Daucus Carota*, *Achillæa Millefolium*, and *Linaria vulgaris* were equally common. These two last are given by A. Wood as natives, but there is of course room for uncertainty as to whether they may not have been introduced before a record was taken of such things. The sward in front of the Catskill Hotel, at a height of 3000 ft. among the Catskill Mountains, might have been an English lawn, so largely was it composed of *Achillæa Millefolium* and *Plantago major*; but not a daisy was to be seen. In traversing the Canadian Pacific, as far as it was then open, to Laggan, among the Rockies, it was very interesting to note the gradual disappearance of European forms as you travelled further west. As far as my very cursory observation went, *Linaria vulgaris* was at that time the only British species to be seen west of Winnipeg, until you again came upon European forms in the alpine flora of the Rockies.—Alfred W. Bennett.

Potamogeton javanicus.* — This plant illustrates the difficulty of want of authentic specimens. As long ago as 1856, Hasskarl, in Act. Soc. In.-Neer. v. 1, pp. 26–27, described a *Potamogeton* under the name of *P. javanicus* from the island of Java. Two years after

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* '*Potamogeton javanicus* Hasskarl, und dessen synonyme, von D. Hans Schinz. Basel, Geng. 1891.'

Baron F. von Mueller described his *P. tenuicaulis* (Fragm. Phyt. Austr. 1858, 1, pp. 90 and 244). Twenty-two years after this, Dr. Buchenau, in Abh. Nat. Ver. Bremen. vol. 7, pp. 32-33 (1880), described *P. parvifolia* from Madagascar; long before this the plant had been gathered in Northern India, and distributed under the name of "*P. hybridus* Michx.?," a determination that might well be made, except by a student of the genus. It had been gathered in Africa by Welwitsch, and named *P. Huillensis* by him. In Journ. Bot. 1887, p. 177, failing to see a type-specimen of *javanicus*, I wrote, "it seems distinct from *tenuicaulis*," yet I had then seen that Barter's Niger plant was the same as Mueller's (*cfr. l. c.*, p. 178). It was left to Dr. Schinz, by the aid of a specimen, seen and accepted by Hasskarl as his plant, to determine for certain that they were the same; but Dr. T. Morong had previously identified the Formosan and Korean specimens with Mueller's species. Dr. Schinz gives a full account of its synonymy, history, and distribution; to the latter may be added—

CHINA.—Prov. Shantung, *Maingay* 170!

JAVA.—*Forbes*, No. 905!

AFRICA.—Deep lake near Jeba, *Barter*, No. 1069! S.E. Africa, *Commander Nelson*!

MADAGASCAR. — Kaloscari, *Hans Schur* in herb. Buchenau! *Humblot*, No. 330! *Baron*, No. 4137! — ARTHUR BENNETT.

LYCOPODIUM ALPINUM.—When I was in Wales last summer, I noticed on the hills to the south-west of Bethgelert a curious growth of *Lycopodium alpinum*, which may be worth recording. The plant formed what were apparently the so-called "fairy rings." Some of these circles or rings were quite perfect, and measured sixteen yards across. At their circumference the plant was most luxuriant, reminding one of a box edging. Inside the circles there were scattered plants, but these were much impoverished.—HENRY T. MENNELL.

NOTICES OF BOOKS.

The Flora of Warwickshire. The Flowering Plants, Ferns, Mosses, and Lichens by JAMES E. BAGNALL, A.L.S.; the Fungi by W. B. GROVE, M.A., and J. E. BAGNALL. London: Gurney and Jackson. 1891. 8vo, pp. xxxiv. 519, map. Price £1 1s.

PRESSURE of material and limited space have prevented us from reviewing earlier this useful addition to our local Floras, which, although dated 1891, reached us a welcome Christmas present: and our notice now will be but brief, and in no way commensurate with the value of the book. A reviewer's duty is to be critical: to point out, indeed, the merits, but not to ignore the defects, of the book submitted to him: and thus it happens that some of our notices of local Floras have savoured of a well-known passage in the Book of Common Prayer, pointing out that the compilers "have done those things which (they) ought not to have done, and have left undone (those things which they) ought to have done." For this kind of criticism Mr. Bagnall's book affords singularly little material.

Extreme care is evident on every page of the book. A long residence in the county has enabled Mr. Bagnall to examine personally a very large proportion of the localities enumerated, and this is the more noteworthy because, as he tells us in his modest preface, "all (his) work, whether clerical or botanical, has been done in the scant leisure of a manufactory clerk." It is true that we do not find here the wealth of observation which places the *Flora of Plymouth* at the head of our local Floras; but this may be in part owing to Mr. Bagnall's retiring disposition. We are confirmed in this view by a recollection of his various contributions to our pages, and we are inclined to regret that the author's twenty years' study of Brambles in the field has not found fuller expression in his book. But the distribution of the local forms, both of *Rubus* and *Rosa*, is worked out with unusual completeness.

There is the usual introductory matter, dealing with topography, geology, meteorology, &c., followed by the division of the county into ten districts, "by means of the water-partings of its principal rivers." The summary of geographical distribution, and an excellent "sketch of the progress of botanical investigation in Warwickshire," which contains much original biographical matter, come at the end of the book. The moss-flora is remarkably complete for a local Flora: it occupies (with the *Hepaticæ*) fifty-six pages, and is almost entirely the result of Mr. Bagnall's observations. The list of lichens is very brief, and no localities are given; the fungi (Hymenomycetes and Gasteromycetes) take more than eighty pages, and full use has been made of Mrs. Russell's extensive series of drawings of Warwickshire fungi, now in the British Museum. The large British Herbarium of that institution has also been utilised; Mr. Newbould, the absence of whose ready help in such matters will be felt by future workers, having kindly gone through it and made extracts. In one of these records, however, though not by Mr. Newbould, occurs almost the only slip we have noticed in going through the book: Mr. Bloxam's specimen, by which *Potamogeton acutifolius* claims admission to the county flora, has been somehow combined with another from Sowerby on the same sheet, and appears as if it had some connection with E. Bot. 2609, which is not the case: the date added, 1859, is that at which Sowerby's Herbarium was acquired, Mr. Bloxam's specimen being undated.

The print and paper of the book are excellent; and Mr. Bagnall is to be congratulated on the manner in which he has carried out his undertaking.

Commercial Botany of the Nineteenth Century. A Record of Progress in the Utilisation of Vegetable Products in the United Kingdom, and the Introduction of Economic Plants into the British Colonies, during the Present Century. By JOHN R. JACKSON, A.L.S. London: Cassell. 1890. 8vo, pp. 168, cuts. Price 3s. 6d.

MR. JACKSON's more than thirty years' connection with the Museums of Kew renders him obviously the right person to undertake a work of this kind: and he has given us a plain straight-

forward account of commercial botany, within the lines laid down in the title of this handy little book. There is no attempt at style or literary elegance; but Mr. Gradgrind himself could not desire a more ample accumulation of "facts" than are here presented to us.

"A commercial rather than a scientific arrangement has been adopted, as being probably the more generally useful"; and, as there is an excellent index, every species referred to is easily accessible. The subject is divided into fourteen chapters, dealing respectively with India-rubber; Gutta-percha; Food products; Beverages; Drugs; New Drugs; Oils and Waxes; Gums, Resins, and Varnishes; Dyes and Tanning Materials; Paper Materials; Fibres; Fodders; Timbers and Hard Woods; Miscellaneous Products.

There is little which calls for criticism, but we notice that Mr. Jackson has quoted (p. 23) certain names which were published in the Kew Report for 1880 as new, without description—a course of action against which we protested at the time; and has failed to note that two were afterwards withdrawn. Thus "*Willughbeia Burbidgei* Dyer in Kew Gard. Rep. 1880" = *W. firma* Blume, ex Hook. f. Fl. Brit. India, iii. 624; "*Chilocarpus flavescens* Kew Gard. Rep. 1880, 47" = "*W. flavescens* Dyer in Herb. Kew" (*op. cit.* iii. 625). *W. Treacheri* of the Kew Report is, we imagine, still roaming about the world without a godfather and without corporate existence, as the spirit of an unbaptised child is supposed to do.

The book is well printed; one of the very few misprints occurs on the plate facing the title—"Saccharum officin*i*arum": but some of the blocks show signs of frequent service elsewhere.

Atlas Deutscher Meeresalgen. Zweiter Heft. Lieferungen I. & II. [tabs. 26 to 35]. Von Dr. J. Reinke.

The Marine Algæ of the Dunbar Coast and of the Orkney Islands. By George W. Traill, ex Trans. Bot. Soc. Edinb. xviii. 1890.

The second part of Dr. Reinke's great undertaking has at length appeared, and it fully maintains the very high standard set before him by its author. It deals with *Phacophyceæ*, as its predecessor did for the greater part, and we thus have its author at his best, since on this group he had already made himself the acknowledged authority. The forms figured and described are *Chorda Filum* and *C. tomentosa*, *Isthmoplea sphærophora*, *Stictyosiphon tortilis*, *Spermatochnus paradoxus*, and the more ample letterpress is much to be welcomed. *Chorda* is dealt with in exhaustive fashion, and the well-known difficulties in respect of this genus are satisfactorily made plain. The great interest of the *Atlas* to British phycologists has already been pointed out, and, indeed, it is a necessary book to all who mean earnest work at our Marine Algæ.

Mr. Traill's two contributions to our own marine flora follow hard on others recently noticed in these pages.* His Dunbar list is particularly interesting, since it fills up the gap between Mr. Batters' list and Mr. Traill's own excellent *Algæ of the Firth of*

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* Journ. Bot. 1890, 381; 1891, 91.

Forth. These, with Mr. Jack's Arbroath list (Journ. Bot. 1890, 10), show how well the east coast of Scotland is being explored. Mr. Traill's Orkney list is the more interesting of the two, from the outlying character of the flora. His work bears all the marks of thoroughness, and the critical remarks are of value, apart from the local record of the species. The classification used in both lists is considerately the same as that of Mr. Batters, and the author has given an index in both cases to the species. These lists are models for other workers, on which we anticipate no improvement.

G. M.

ARTICLES IN JOURNALS.

Botanical Gazette (Feb.). — D. H. Campbell, 'Apical Growth of *Osmunda* and *Botrychium*' (1 plate).—B. L. Robinson, *Luina Piperi*, *Silene Suksdorfii*, spp. nn. (1 plate).—J. B. Ellis & F. W. Anderson, 'New Montana Fungi' (1 plate).—A. C. Stokes, 'Key to N. American *Labiatæ*.' — G. E. Davenport, '*Notholæna Nealleyi*.' — T. Meehan, '*Sarcodes sanguinea*.'

Bot. Centralblatt (Nos. 8–11).— G. Kuntze, 'Zur vergleichenden Anatomie der Malvaceen.' — (No. 9). J. M. Hulth, 'Ueber Reservstoffbehälter bei Flechten.'—A. G. Kellgren, 'Einige pflanzenphysiognomische Notizen aus dem nördlichen Dalsland.'— O. Juel, *Thecaphora Pimpinellæ*, *Sphærotheca Drabæ*, spp. nn.—(No. 11). A. Minks, 'Was ist *Atichia*.'

Bot. Zeitung (Feb. 27).—H. Vöchting, 'Ueber die Abhangigkeit des Laubblattes von seiner Assimilations-Thätigkeit.'—(Mar. 4–20). C. Weihner, 'Die Oxalateabscheidung im Verlauf der Sprossentwickelung von *Symphoricarpus racemosa*' (1 plate).

Bull. Soc. Linn. Paris (Séances du 3 Jan. & 18 Feb.).— H. Baillon, 'Les Sapotacées de la Nouvelle-Calédonie.' — (Séance du 18 Feb.).—H. Baillon, 'Sur le *Monotheca* et son organisation florale.'

Bull. Soc. Bot. France (xxxviii., Comptes rendus 1 : Mar. 1).— P. Duchartre, 'Sur les ovaires infères et plus particulièrement sur celui des Pomacées.' — C. Camus, 'Le genre *Ophrys* dans les environs de Paris.' — Id., '*Orchis Arbostii* Camus (*O. Morio* × *O. incarnata*).'—E. Prillieux, 'La pourriture du cœur de la Betterave.' —H. Devaux, 'Hypertrophie des lenticelles.'—Id., 'Croissance des poils radicaux.'— A. Chatin, 'Contribution à l'histoire naturelle de la Truffe.'

Bulletin of Torrey Bot. Club (Jan.). — T. Holm, 'Notes on *Uvularia*, *Oakeria*, *Diclytra*, and *Krigia*' (3 plates). — C. H. Kain, 'Recent contributions to literature of *Diatomaceæ*.'— C. MacMillan, '*Salvinia natans* in Minnesota.'— B. D. Halsted, 'A new Anthracnose of Peppers' (*Colletotrichum nigrum*).'—D. H. Campbell, 'Archegonium of Ferns.'—T. Meehan, 'Virginia Creeper.'—(Feb.). N. L. Britton, Enumeration of Rusby's S. American plants.—T. Morong, 'Flora of Desert of Atacama.' — E. G. Britton, 'Supplementary

enumeration of Mosses collected by Leiberg in Idaho.'—E. J. Hill, '*Zizania* as found by the explorers of the North-west.'

Gardeners' Chronicle (Mar. 7).—*Galanthus Alleni* Baker, sp. n.—C. B. Plowright, 'Diseases of Plants.'—(Mar. 14). *Tulipa Sintenisii* Baker, sp. n.

Journal de Botanique (Feb. 16).—F. Gay, 'Le genre *Rhizoclonium*.' —C. Sauvageau, 'La tige des *Zostera*.'—(Mar. 1). E. Bureau & A. Franchet, 'Plantes nouvelles du Thibet et de la Chine occidentale' (*Brachyactis chinensis*, *Gnaphalium Dedekensii*, *G. nobile*, *G. corymbosum*, *G. thibeticum*, *Chrysanthemum tatsienense*, *Senecio erythropappus*, *S. cyclotus*, *S. nelumbifolius*, *S. tatsienensis*, *S. subspicatus*, *S. microdontus*, *Saussurea semilyrata*, spp. nn.). — P. Hariot, 'Les *Trentepohlia* pléiocarpes.' — A. Franchet, 'C. J. Maximowicz.' — P. A. Saccardo, 'Recommandations aux phytographes.'

La Nuova Notarisia (Mar. 2). — A. Picconi, 'Noterelle ficologiche.'— R. Gutwinski, 'Algæ e lacu Baykal et e pæninsula Kamtschatka.'—A. Borzi, 'Noterelle ficologiche.'

Naturalist (March). — J. B. Davy, Additions to Flora of Alford, N. Lincolnshire. — A. Shackelton, 'Disappearance of Yorkshire Plants.'

Notarisia (Feb. 28). — R. F. Harvey-Gibson, 'I cistocarpi e gli anteridi di *Catenella Opuntia*.'—W. West, 'Sulla conjugazione delle Zignemee' (2 plates). — Istvanffi-Schaarschmidt, 'Alghe raccolti nel lago di Schloss-See in Baviera.'— O. Muller, 'Bacillariacées de Java.'

Oesterr. Bot. Zeitschrift (March). — M. Willkomm, 'Neue und kritische Pflanzen der spanisch-portugiesischen und balearischen Flora' (*Veronica commutata*, *Conopodium elatum*, *Medicago Gaditana*, *Rhamnus bæticus*, spp. nn.). — J. Murr, 'Die Carex-Arten der Innsbrucker Flora.'

Pharmaceutical Journal (Mar. 14).— H. G. Greenisch, 'Note on *Phlox Carolina*.'

BOOK-NOTES, NEWS, &c.

With reference to the proposed reprint from these pages of the "Biographical Index of British and Irish Botanists," we note that *Nature*, in a friendly reference to it, "regrets to learn that the project is likely to fall through in consequence of the very small number that have responded to the appeal for a very small subscription." The response to an appeal has certainly been small hitherto, as only about a hundred copies have been subscribed for; but we trust it may not be necessary to abandon the scheme. The price of the work to subscribers will be 4s., post-free.

Under the title of "Fra Islands Vægtrige," Herr S. Stefánsson has published in the *Vid. Medd. Forening Copenhagen*, 1890, a paper on Icelandic Botany, with some additions to its Flora. As the work of a native Icelander, it is interesting.

Timehri for December last contains a paper on "The Barbados Sugar-cane Experiments," by Mr. J. B. Harrison.

The last part (xxiv. 1) of the *Journal and Proceedings of the Royal Society of N. S. Wales* contains descriptions of new Arnheim's Land plants by Baron von Mueller, and an obituary notice, with bibliography, of the Rev. J. E. Tenison Woods.

The *American Journal of Science* for March contains a paper by Prof. J. S. Newberry on "The Flora of the Great Falls Coal Field, Montana," with a plate figuring several new species.

A Check-list of the arborescent flora of the United States will shortly be issued by the Forestry Division of the U. S. Department of Agriculture.

Zoe for December contains an account of an arborescent form of *Athyrium Filix-fœmina*, received in 1888 from Humboldt's County, California. "The best developed of these plants has an erect caudex two feet in height, five or six inches in diameter, dividing near the apex and crowned with very large fronds, the largest more than five feet in length, and over two feet in width." The same journal for January publishes a somewhat acrimonious discussion between Dr. N. L. Britton and the Editor with reference to a review of the former's "List of State and Local Floras," which appeared in that journal. Mr. C. F. Millspaugh enumerates the *Euphorbiaceæ* collected in California by Mr. T. S. Brandegee, and describes two new species, *Euphorbia Watsonii* and *E. biserrata*.

MM. Porta and Rigo have returned from their botanical expedition to Spain; their chief explorations were in Murcia, and in the neighbourhood of Carthagena and Alicante. The collections formed, which contain several new species, will be distributed as soon as possible.

We are glad to learn that the *Official Guide to Kew Gardens*, which has for some time been out of print, is likely to be re-issued in time for summer visitors. The changes consequent on the re-arrangement of the collections have caused the delay, which lately formed the subject of a question in the House of Commons.

A new instalment of Prof. Baillon's *Histoire des Plantes* has lately been issued, containing monographs of *Asclepiadeæ*, *Convolvulaceæ*, *Polemoniaceæ*, and *Borragineæ*.

The last volume (iv. 1889–90) of the *Annuario del R. Istituto Botanico de Roma* (Milan, 1891) is mainly occupied by a 'Synopsis Plantarum vascularium Montis Pollini,' by Dr. N. Terracciano. Four new species are figured—*Sedum brutium*, *Seseli inæquale*, *Ornithogalum brutium*, and *Poa pollinensis*. The other papers are 'Fungi aliquot Mycologiæ Romanæ addendi,' by Prof. Saccardo, with one plate; 'I fasci midollari delle Cicoriacee,' by Dr. O. Kruch, with fifteen plates; and a short paper by the editor, Dr. Pirotta, 'Sulla struttura anatomica della *Keteleria Fortunei*.'

The Rev. T. S. Lea has published "An Introduction to the Herbarium" of the Kidderminster Museum, which is at present

limited to British phanerogams and ferns; "a collection of mosses has been commenced, and one of sea-weeds is in contemplation," but "the Herbarium cannot at present attempt the lichens or the fungi." "A series of well-authenticated species of the difficult genus *Rosa*, and the yet more hopeless *Rubus*, not to mention several Grasses, will be found." The collection numbers 1150 species. "Its value lies in its use. If it never comes out of its cupboard, it might just as well not be in it."

Prof. Saccardo sends us an interesting pamphlet, the purport of which is sufficiently explained by its title:—"Chromotaxia, seu Nomenclator Colorum polyglottus additis speciminibus coloratis ad usum botanicorum et zoologorum." The *Supplementum* to his *Sylloge Fungorum* is announced to appear during the present year.

Mr. A. S. Hitchcock's *Catalogue of the Anthophyta and Pteridophyta of Ames, Iowa*, issued by the Shaw School of Botany on "*Februry* 4, 1891" (we trust this is not a new transatlantic development!), is interesting to Europeans chiefly from a nomenclature point of view. Mr. Hitchcock is an adherent of the new school, though hardly a consistent one. For instance, he says, "If *Nymphæa tuberosa* Paine and *N. reniformis* are the same . . . . our plant becomes *Castalia reniformis* (DC.)." Why? *Nymphæa reniformis* was published, not by DeCandolle, but by Walter in the *Flora Caroliniana*, which Mr. Hitchcock constantly cites. Why, then, should DC. stand as the authority for the name? We note, too, that Dr. Britton's name is becoming frequently abbreviated into "Britt." It may perhaps be presumptuous to suggest that there is any danger of confusing this rising American botanist with the Editor of this Journal; but the latter certainly has equal right to the abbreviation, especially as his species in the *Flora of Tropical Africa* considerably antedate the more numerous contributions of his almost-namesake. In cases like this, the possibility of confusion is best avoided by printing the name in full, especially as the saving in space by the abbreviation is very trifling.

Prof. Martens has done well to translate into a more generally known language the memoir of Cardinal Haynald which was issued in Hungarian by Prof. Kanitz in 1889, on the occasion of his Eminence's sacerdotal jubilee. The memoir, to which is prefixed a very charming portrait in photogravure, deals entirely with the Cardinal in his connection with Botany—a study which he began in 1826, when hardly ten years old, and describes his herbarium, which is of considerable extent, and includes the collections of Heuffler, Kotschy, H. G. Schott, and Sodiro. This French translation is beautifully printed; it is published at Ghent, by A. Siffer.

We note with pleasure that the University of Aberdeen has conferred the degree of LL.D. on Professor Daniel Oliver, and by so doing has honoured itself as well as the recipient of the title.

PRINGLE'S PLANTÆ MEXICANÆ. Sixth Annual Distribution, 1890. — The Subscriber offers sets of 284 Species (one-fifth new to Science), at 28 Dollars; and desires to announce that OSWALD WEIGEL, Konigstr. No. 1, Leipzig, Germany, is henceforth his Sole Agent for the Continent, and will furnish his Collections in the original Fascicles and undiluted.

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Polycarpaea spathulata (Hook.f.)

NOTES ON THE HISTOLOGY OF *POLYSIPHONIA FASTIGIATA* (Roth.) Grev.

By R. J. Harvey Gibson, M.A., F.L.S., F.R.S.E.
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[Plate 304.]

Polysiphonia fastigiata (Roth.) Grev. occurs abundantly on the British coast-line as an epiphyte on *Ascophyllum nodosum* (Le Jol.). The following histological notes deal with (*a*) the protoplasmic continuity between the cells of the frond; (*b*) the development and escape of the tetraspores; (*c*) the pericentral intercellular spaces; (*d*) the mode of union of the epiphyte to the "host" plant.

(*a*). *The continuity of protoplasm between the cells of the frond.*—Wright* describes the protoplasmic contents both of the central and pericentral cells as being, in the young condition, in complete communication, but states that, as the cell becomes mature, the "pore openings" become closed up by "plugs," homologous with those described by Archer as occurring in *Ballia callitricha*.† He also remarks that in old cells, "where this closing up has long since taken place," the canal-like pits in the central and pericentral cell-walls are not occupied by protoplasm, but by granular secondary deposits. Schmitz‡ asserts, on the contrary, that the protoplasmic continuity is maintained during the life of the cells. Massee§ says that "the manner in which the continuity of protoplasm between adjacent cells is kept up varies with the age of the cells." In the young condition, free and complete protoplasmic continuity is maintained. "After the openings have reached a certain size, they are closed up by the growth of a cellulose plate, to the margin of which the protoplasmic sac or primordial utricle is attached. The plate is perforated by minute holes, through which slender threads of protoplasm pass."

In a paper by Wright, "On the Cell-structure of *Griffithsia setacea* Ellis, and on the Development of its Antheridia and Tetraspores,"‖ the author describes the "plugs" in that species as, in older cells, composed of two plates, which may be separated by the action of reagents.

That the protoplasmic contents of two central, of central and pericentral, or of two pericentral cells, communicate in the young state, there can be no doubt. That the continuity of protoplasm is maintained in older conditions is, I think, not the case. In the first place,

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* "On the so-called Siphons, and on the Development of the Tetraspores in *Polysiphonia*," *Trans. Roy. Ir. Acad.* xxvi. p. 512.

† "On the Minute Structure and Mode of Growth of *Ballia callitricha*," *Trans. Linn. Soc.* (Bot.), vol. i. pt. 4, p. 211.

‡ "Untersuch. über d. Fruchtbild. d. Florid.," *Akad. d. Wissensch. z. Berlin*, 1883, p. 215.

§ "On the Formation and Growth of Cells in the Genus *Polysiphonia*," *Jour. Roy. Micr. Soc.* 1884.

‖ *Trans. Roy. Ir. Acad.* vol. xxvi. p. 491.

careful examination of fresh fronds (under a Zeiss $\frac{1}{12}$ oil immersion) shows no continuity whatever. Between the "plug" and the protoplasm on either side fine granular striæ *are* certainly visible, and these striæ are continued into or on to the "plug," as seen on side view. If the frond be treated for a few minutes with mineral acid, the cells are separated, and the nature of these striæ becomes evident. The "plug" is practically a cork closing the end of the canal in the special cell-wall of the central or pericentral cell; the wall of the canal, as age advances, undergoes secondary modifications, which express themselves as delicate longitudinal striæ or "fibrillar thickenings" (as described by Murray and Boodle in *Spongocladia*),* running from the borders of the "plug" up the sides of the canal. If the frond, after treatment with a macerating reagent, be gently crushed, the "plug" separates from one or both cells, and the fibrillar thickenings may then be made out as a delicate fringe of fine threads arising from the margin of the "plug," and quite independent of the protoplasmic contents of the canal (Pl. 304, fig. 11). I have observed this in cells only 10 or 12 articulations from the apex of the frond. Isolated "plugs" show the granulations figured by Massee (*l. c.*), while young "plugs" show as well one or two distinct apertures, which are entirely absent from the older "plugs." These I take to be the true apertures through which continuity of protoplasm in young cells is maintained; whilst the granulations of older and completely formed "plugs" are due to unequal or heterogeneous deposition of the substance of which the plug is composed (fig. 10).

The central cells usually show a very well marked axial strand of protoplasm surrounded by a granular "primordial utricle," the axial strand being continuous with the contents of the canals in the cell-wall. The pericentral cells show a distinct differentiation into a granular adaxial plate, and a denser abaxial portion, from the ends of which arise the intercellular protoplasmic threads (in the young state), or the projections which represent these (in older cells). (Figs. 6, 8, 12.)

(*b*). *The mode of development and escape of the tetraspores.*—In describing the tetraspores of *P. urceolata* and *P. atrorubescens*, Wright (*l. c.*) says that their point of origin seems to be always between the central cell and its surrounding cells, a small portion of protoplasm being detached from the central cell, which portion then divides transversely, the lower part forming a "minute parallelogram," and the upper becoming completely divided into four tetraspores. The tetrasporangium and the "parallelogram" have, at least in the young condition, protoplasmic continuity, which, however, becomes interrupted later on by the usual plug-like thickening. Massee (*l. c.*) and Kolderup Rosenvinge† describe the mother cell first formed from the central cell as subdividing (Massee describes the process as one of "budding") into two

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* "On the Structure of *Spongocladia* Aresch.," *Annals of Botany*, vol. ii. Aug. 1888.

† "Bidrag til Polysiphonias Morphologie," *Bot. Tidssk.* 1885, p. 11.

pericentral and one intermediate cell, which latter subdivides into the mother cell of the tetraspores and the basal cell ("parallelogram" of Wright).

I am unable to confirm this account of the mode of origin of the pericentral and intermediate cells. The process seems to be one of ordinary, but incomplete, division. The apical cell first of all segments transversely into a new apical cell and a disc-shaped segment connected by means of five very distinct strands of protoplasm with the new apical cell. The disc then suffers division in four radial planes, which, however, do not penetrate to the centre. One of the arms of the cross so formed (figs. 1–5) next segments radially into two cells, which are destined to become pericentral cells. A new cell is then cut off from the central cell to form the intermediate cell. The connection of the intermediate cell with the pericentral cells is near the abapical ends of the latter, while in ordinary pericentral cells the connections with the central cell spring from the middle or junction of the abapical two-thirds.

I have also preparations which show the intermediate cell in connection with three pericentral cells; I have no doubt that the intermediate cells may, in larger sporiferous branches, be in connection with even four pericentral cells (fig. 6). I have observed isolated intermediate cells with five processes, one obviously that by which it had been in connection with a central cell, and four processes which had been in connection with four pericentral cells.

The intermediate cell, as soon as formed, subdivides horizontally into a basal cell, and the mother cell of the tetraspores, in which latter six division planes make their appearance, resulting in the formation of four tetrahedra. One of these tetrahedra maintains for some time protoplasmic continuity with the basal cell, but when the tetraspores are ripe, the connection is interrupted by the formation of a "plug." The tetraspores have special cell-walls inside the mother cell-wall.

By growth in size of the tetraspores the sporiferous branch assumes an irregular tuberculate appearance, each swelling corresponding to one sporangium. The sporangia are most commonly developed on alternate sides of the central cell, every central cell giving rise to a sporangium, although abortion of the sporangium frequently occurs. By the progressive enlargement of the sporangium, the pericentral cells are greatly distorted, as is also the central cell (fig. 7). The thick special cell-walls of the pericentral cells separate, and the pressure being thus relieved, the sporangium is forced into the intercellular gap so formed. The cuticular investment gives way, the sporangial wall bursts, and is withdrawn into the cavity of the branch, while the tetraspores escape as a group, becoming separated, and assuming a spherical form when isolated. The external cuticular wall of the branch shows no rupture, although it always appears more granular at the spots where discharge of the tetraspores has taken place.

(*c*). *The pericentral intercellular spaces.*—Between the pericentral and the central cells, and at the level of the junction of the walls of two central cells, well-marked intercellular spaces occur,

especially in sporiferous branches, though not confined to them. These spaces have a distinct lining of their own, probably differentiated from the outer layers of the adjacent cell-walls. The spaces frequently contain yellowish granules (figs. 9, 12).

(*d*). *The mode of attachment of the epiphyte to the "host" plant.*—The attachment of the epiphyte to *Ascophyllum* is very intimate. Root-filaments given off from the base of the frond penetrate deeply into the tissue of the host, and wander amongst the cortical cells and medullary hyphæ. The root-filaments have very thick cell-walls and central cells only, these being very much elongated.

EXPLANATION OF PLATE 304. — Figs. 1—5, Stages in the development of the pericentral and intermediate cell (Zeiss $\frac{1}{12}$ oil immer.). 6, Transverse section of a sporiferous branch, showing a basal cell (*a*) in connection with three pericentral cells (*b*, *b*, *b*); *c*, central cell; *d*, ordinary pericentral cells (Zeiss, E.). 7, Sporangium in the act of expelling tetraspores (Zeiss, E.). 8, A large central cell, showing differentiation of protoplasm (Zeiss $\frac{1}{12}$). 9, A chain of pericentral spaces (Zeiss, E.). 10, Isolated "plugs" from young cells (Zeiss $\frac{1}{12}$). 11, "Plugs" (*p*) separating adjacent canals of two central cells, showing striæ of the canal-wall (*s s'*) (Zeiss $\frac{1}{12}$). 12, Longitudinal section through an old articulation; *a*, pericentral intercellular spaces; *b*, pericentral cells; *c*, central cells; *p*, *p*, "plugs" (Zeiss $\frac{1}{12}$).

KEY TO THE GENERA AND SPECIES OF BRITISH MOSSES.

BY THE REV. H. G. JAMESON.

(Continued from p. 45.)

KEY TO THE SPECIES.

(N.B.—Only those genera which comprise more than one British species are included in this part of the Key.)

AMBLYSTEGIUM.

1 { Ls. nerveless; pl. v. small and slender 2
  { Ls. singly nerved half-way or more 3

2 { Caps. erect; lid mamillate; ls. erecto-patent; dioicous ..... *Sprucei*
  { Caps. cernuous; lid apicul.; ls. subsecund; monoicous ... *confervoides*

3 { Nerve slender, usu. ceasing below upper $\frac{1}{3}$ of leaf 4
  { Nerve strong, running up almost or quite to apex 5

4 { Pl. r. robust; ls. ovate, usu. subcomplan.; cells narrow ..... *riparium*
  { Pl. v. slender; ls. ovate-lanc.; cells wider ..... *serpens*

5 { St. ls. from deltoid-ovate base, acuminate; caps. arcuate 6
  { Ls. oblong, w. shorter subacute points; caps. suberect ..... *fluviatile*

6 { Pl. slender, fixed by numerous radicles; ls. spreading ..... *radicale*
  { Pl. larger, st. sc. rooting; ls. m. or l. secund ..... *irriguum*

AMPHORIDIUM.

1 { Ls. curled when dry, basal cells thin-walled ..... *lapponicum*
  { Ls. sc. curled, basal cells incrassate ..... *Mougeotii*

ANDREÆA.

1 { Ls. nerveless 2
  { Ls. singly nerved 3

2 { Ls. ovate-lanc., papillose, obtuse or m. or l. acute .....*petrophila*
Ls. obovate-spathul., suddenly and shortly acumin., smooth ...*alpina*

3 { Ls. papillose, nerve narrow, lamina distinct to apex .....*nivalis*
Ls. smooth or nearly so, lamina narrowed above.....4

4 { Nerve thick, occupying all upper part of subula .....*crassinervis*
Nerve less defined, occupying only middle ⅓ of subula.....*Rothii*

ANOMODON.

1 { Ls. narrow, acuminate.....*longifolius*
Ls. obtuse or apiculate 2

2 { Pl. robust; ls. entire, obtuse .....*viticulosus*
Pl. slender; ls. apicul., often serrul. at apex .....*attenuatus*

ATRICHUM.

1 { Ls. lingulate, undulate, cells under 25 μ wide 2
Ls. wider, oblong-lanc., sc. undul., cells over 35 μ.....*crispum*

2 { Ls. r. obtuse, serrate near apex only; caps. suberect .....*angustatum*
Ls. acute, serrate throughout; caps. arcuate .....*undulatum*

AULACOMNIUM.

1 { Pl. under 1 inch; ls. serrate; pseudopodia numerous ...*androgynum*
Pl. larger; pseudopodia few or absent 2

2 { Ls. usu. m. or l. serrul. at apex; st. matted w. radicles .....*palustre*
Ls. v. obtuse, imbric., entire; st. sc. radiculose .....*turgidum*

BARBULA.

1 { Nerve w. lamellæ or jointed filaments on inner face 2
Nerve without appendages 7

2 { Leaves hair-pointed, concave 3
Ls. not hair-pointed; n. broad, covered w. granular filaments.....4

3 { Nerve w. 4 broad lamellæ above; caps. cylindric.....*lamellata*
N. gemmiferous above; ls. spathulate, v. papillose .....*papillosa*

4 { Ls. obtuse; caps. elliptic; lid rostrate; synoicous .....*brevirostris*
Ls. m. or l. pointed; dioicous 5

5 { Caps. elliptic, half-covered by cal.; perist. v. contorted .....*stellata*
Caps. narrow; cal. covering lid only; perist. less twisted.....6

6 { Caps. oblique; perist. pale at base; ls. acute.....*aloides*
Caps. erect; perist. red; ls. incurved-cucullate at tip .....*ambigua*

7 { Nerve excurrent in a hair; ls. usu. oblong or spathulate 6
Ls. without hair-points 16

8 { Pl. small; peristome not tubular (exc. *canescens*) 9
Pl. robust; perist. partly tubular; ls. usu. dingy-green 13

9 { Ls. ovate-lanc., denticul. at apex; caps. oblique .....*suberecta*
Ls. m. or l. oblong, entire; caps. erect 10

10 { Ls. w. thickened, sc. reflexed border, pale green .....*marginata*
Ls. without thickened border.....11

11 { Leaf-margin strongly revolute.....*muralis*
Margin plane, or slightly revolute only 12

12 { Caps. cylindric; perist. t. free; ls. w. green hair-point .....*Vahliana*
Caps. elliptic; perist. tubular for ½ its length .....*canescens*

13 { Hair-point alm. smooth; ⅓ of perist. tubular; monoicous ...*lævipila*
Hair spinulose; ½ perist. tubular; dioicous or synoicous.....14

14 { Ls. squarrose, margin recurved; cells 10—12 μ .....*ruralis*
Ls. erecto-patent, margin usu. plane above.....15

15 { Ls. olivaceous-green; cells 6—7 μ; dioicous .....*intermedia*
Taller; ls. ferruginous; cells 10—12 μ; synoicous .....*princeps*

16 { Margin strongly revolute to apex; ls. sc. ½ line long 17
Ls. plane at apex, margin m. or l. revolute below only 18

17 { Ls. lanc., acute; n. excurrent in a sharp point.....*Hornschuchiana*
Ls. r. obtuse; n. forming a short mucro or vanishing .....*revoluta*

18 { Perich. ls. v. large, convolute, exserted 19
Perich. ls. not conspicuous.....20

19 { Ls. about ½ line long; caps. narrowly oblong .....*convoluta*
Ls. about 1 line, dull green; caps. elongate; pl. taller.....*commutata*

20 { Ls. w. short points, obtuse or mucronate, usu. obl. or obovate 21
Ls. tapering to longer, m. or l. acute points, lanc. or linear 27

21 { Nerve much thickened towards apex .....*atrovirens*
Nerve uniform, or narrowing towards apex 22

22 { Ls. w. thickened border, lingulate, mucronate .....*Brebissoni*
Ls. without thickened border.....23

23 { Ls. smooth, soft, rosulate above, usu. mucronate .....*cuneifolia*
Ls. papillose 24

24 { Ls. obtuse, rounded or emarginate, dark-green .....*latifolia*
Ls. mucronate 25

25 { Ls. 2—3 lines long; caps. v. long; perist. tubular 26
Ls. under 1½ line long; perist. teeth free .....*unguiculata*

26 { Slender; leaf-border of 2 layers, sharply defined.....*angustata*
Robust; border indistinct or alm. none, not thickened.....*subulata*

27 { Ls. w. plane margin, long and narrow, much crisped when dry ...28
Ls. usu. lanc., less crisped, margin recurved below 32

28 { Basal hyaline cells ascending up margin of leaf.....29
Hyal. cells not higher at margin than at centre .....*hibernica*

29 { Ls. squarrose, serrate near apex .....*squarrosa*
Ls. not squarrose, entire or slightly denticul. only 30

30 { Ls. rigid, straight, erect, mostly broken across.....*fragilis*
Ls. undulate, less fragile.....31

31 { Ls. v. long, w. long, tapering, subdenticul. points .....*tortuosa*
Ls. about 1½ line long, entire, with short points .....*inclinata*

32 { N. distinctly excurrent in a fine point; ls. rigid .....*acuta*
Nerve ceasing in or below apex.....33

33 { Perist. long, contorted; ls. acute, strongly papillose.....34
Perist. short, sc. twisted; ls. usu. subacute, less papillose 37

34 { Ls. usu. squarroso-recurved; cells rounded, incrassate 35
Ls. not squarrose; cells angular, r. obscure, smaller 36

35 { Ls. trifarious, recurved, v. papillose on back of nerve .....*recurvifolia*
Ls. less recurved towards apex, more tapering .....*fallax*

36 { Ls. linear-lanc., long, spreading; caps. cylindric .....*cylindrica*
Ls. lanc., straight, short (about 1 line); caps. oblong.....*vinealis*

37 { Basal cells narrow-rectangular; n. ending in apex.....*rigidula*
Basal cells oval; n. ceasing below the r. obtuse point .....*spadicea*

BARTRAMIA.

1 { Ls. smooth, recurved towards apex (seta erect) .....*Œderi*
Ls. papillose, patent or spreading, w. long, narrow points 2

2 { Caps. erect, symmetric; perist. single; ls. erecto-patent.....*stricta*
Caps. oblique; perist. double 3

3 { Ls. w. large, white, sheathing base; upper cells long .....*ithyphylla*
Ls. sc. sheathing; upper cells short, alm. quadrate.....4

4 { Seta erect; caps. exserted; ls. usu. glaucous-green .....*pomiformis*
Seta v. short, curved; caps. m. or l. hidden in the ls. .....*Halleriana*

BLINDIA.

1 { Caps. immersed; perist. absent; pl. v. small .....*cæspiticia*
{ Caps. exserted; perist. single; pl. 1—4 in. .....*acuta*

BRACHYTHECIUM.

1 { Ls. suddenly contracted to long geniculate apiculus .....*cirrhosum*
{ Ls. without filiform apiculus, acute or acuminate 2

2 { Seta smooth; ls. plicate, w. long tapering acumen.....3
{ Seta rough, at least above; ls. usu. less plicate 5

3 { Pl. monoicous or synoicous; ls. usu. serrul. above .....*salebrosum*
{ Pl. dioicous; ls. nearly or quite entire 4

4 { Branches few, erect, cylindric; ls. pale, v. concave .....*albicans*
{ Pl. usu. procumbent, more branched; acumen usu. twisted...*glareosum*

5 { Seta rough throughout 6
{ Seta smooth below, rough above only 12

6 { Ls. narrowly oblong-lanc.; pl. slender and small 7
{ St. ls. wider, ovate or oblong; pl. usu. larger 8

7 { Ls. nerved alm. to apex; caps. suberect; lid acute.....*populeum*
{ N. ceasing far below apex; caps. cernuous; lid r. blunt ...*velutinum*

8 { Ls. v. widely ovate, w. short acute points; dioicous .....*rivulare*
{ Ls. m. or l. acuminate; monoicous 9

9 { St. ls. v. spreading, ovate-triangular, w. long fine points.....10
{ Ls. ovate, not cordate, usu. more or less imbricate 11

10 { Pl. small and slender; ls. nerved to apex .....*reflexum*
{ Pl. much larger; ls. nerved about ½ or ¾ of length .....*Starkii*

11 { Pl. small; ls. imbricate, with r. marked auricles.....*glaciale*
{ Pl. robust; ls. sc. imbric., without distinct auricles .....*rutabulum*

12 { Ls. v. plicate, w. long acumen; caps. alm. cylindric .....*campestre*
{ Ls. not plicate, w. shorter points, usu. secund.....*plumosum*

BRYUM.

1 { St. stoloniferous; upper ls. in a rosette, large, spathul. .....*roseum*
{ St. not stoloniferous; ls. smaller, not markedly rosetted 2

2 { Pl. silvery white; ls. imbricate, v. concave, n. short.....*argenteum*
{ Pl. red, green, or brown 3

3 { Brs. julaceous w. the concave, imbric. ls.; cells alm. linear 4
{ Brs. not julaceous; cells m. or l. hexagono-rhomboid 5

4 { Ls. wide-ovate, obtuse or apicul., not nerved to apex .....*filiforme*
{ Ls. narrower, acute or subacute, nerved alm. to apex ...*concinnatum*

5 { Ls. obtuse, or shortly apicul. only 6
{ Ls. m. or l. acute or acuminate 9

6 { Ls. not bordered; cilia without appendages; monoicous 7
{ Ls. m. or l. bordered; cilia appendiculate; dioicous 8

7 { Ls. elliptical, subnavicular; caps. small, subglobose .....*Marrattii*
{ Ls. broadly orbicular-ovate; caps. oval-oblong .....*calophyllum*

8 { Ls. cucullate, margin inflexed above, entire .....*neodamense*
{ Margin erect, serrul. at apex; pl. robust [var. of] .....*Schleicheri*

9 { Cilia, when present, without appendages; synoicous or monoicous...10
{ Cilia well-developed, with hooked appendages 15

10 { Ls. shortly pointed, v. concave; caps. small, roundish .....*lacustre*
{ Pl. r. similar; upper ls. w. gemmæ in axils .....*Barnesii*
{ Ls. acuminate, less concave; caps. larger 11

11 { Ls. sc. bordered, margin plane above; caps. r. short .....*Warneum*
{ Ls. distinctly bordered; caps. longer 12

12 { Monoicous; caps. incurved, mouth oblique, small .....*uliginosum*
Synoicous; caps. regular.....13

13 { Pl. dark-brown; caps. w. neck as long as itself .....*rufum*
Pl. usu. yellowish-green; caps. short-necked 14

14 { Caps. usu. pyriform; perist. t. w. several vertical and oblique lines between the transverse articulations .....*pendulum*
Caps. alm. elliptic; teeth w. central vertical line only.....*inclinatum*

15 { Nerve ceasing some distance below apex (dioicous) 16
Nerve reaching apex, or excurrent 18

16 { Ls. v. decurrent on stem, remote; pl. slender.....*Duvalii*
Ls. not or sc. decurrent 17

17 { Ls. incurved-imbricate when dry, like a chain .....*catenulatum*
Ls. concave; cells alm. rectangular; st. v. radiculose .....*origanum*

18 { Ls. w. short, subacute points, not bordered; tufts compact 19
Ls. m. or l. acuminate.....21

19 { Ls. w. straight points, shining; cells 8—10 μ wide 20
Ls. incurved at apex, dull-green; cells 15—20 μ wide... *Mühlenbeckii*

20 { Ls. lanc., usu. reddish or purplish, imbricate .....*alpinum*
Ls. ovate-lanc., yellow-green, less imbric.; pl. short ...*gemmiparum*

21 { Pl. synoicous, or (*pallescens* and *Sauteri*) monoicous 22
Plant dioicous 27

22 { Ls. crowded in tufts at intervals on the stem; margin plane at the toothed apex, not bordered above .....*provinciale*
Ls. more or less uniform on the stem 23

23 { Ls. concave, w. plane margins, not bordered, entire .....*Sauteri*
Ls. less concave, margin recurved 24

24 { Ls. sc. bordered above; caps. often incurved .....*intermedium*
Ls. distinctly bordered w. narrow cells; caps. regular 25

25 { Ls. r. twisted, even when moist; caps. obconic, purple ...*torquescens*
Ls. sc. twisted, even when dry; caps. oblong-pyriform 26

26 { Pl. yellow or lurid-green; nerve r. shortly excurrent .....*bimum*
Lower ls. red, w. long points; pl. matted w. radicles .....*pallescens*

27 { Ls. distinctly bordered w. narrow cells 28
Ls. not or sc. bordered, at least in the upper part.....33

28 { Border thickened, of more than one layer of cells.....29
Border of one layer only.....30

29 { Ls. crisped and twisted when dry, green; caps. clavate ...*Donianum*
Ls. sc. crisped, usu. reddish; caps. oblong-pyriform.....*pallens*

30 { Ls. obovate, abruptly pointed, twisted when dry .....*capillare*
Ls. ovate or lanc., tapering, sc. twisted when dry.....31

31 { Ls. w. plane margin, long-pointed, with r. lax cells .....*barbatum*
Margin recurved below 32

32 { Ls. v. acuminate, entire; caps. obconic, w. long neck .....*obconicum*
Tall; ls. usu. serrul. at apex; caps. oblong .....*pseudo-triquetrum*

33 { Ls. w. long, fine, tapering points, erect when dry; caps. oblong-pyriform; lid large, yellow.....*cæspiticium*
Ls. more shortly mucronate 34

34 { Caps. globose-pyriform, wide-mouthed when dry.....*turbinatum*
Caps. oblong or pyriform, red or purple; pl. small 35

35 { Caps. rounded at base; n. r. longly excurrent .....*atro-purpureum*
Caps. tapering towards base, oblong-pyriform 36

36 { N. r. longly excurrent; cells about 5 μ wide; lid obtuse .....*murale*
N. sc. excurrent; cells 10—12 μ wide; lid apicul.....*erythrocarpum*

BUXBAUMIA.

1 { Caps. plano-convex, glossy; ext. perist. rudimentary.....*aphylla*
  { Caps. sc. flattened, paler; ext. perist. in 4 rows .....*indusiata*

CAMPTOTHECIUM.

1 { Stem w. copious radicular tomentum; seta smooth .....*nitens*
  { Stem scarcely radiculose; seta rough .....*lutescens*

CAMPYLOPUS.

1 { Leaves with hyaline points 2
  { Leaves without hyaline points.....4

2 { Points long, leaf-margin incurved; n. of 4 strata below.....3
  { Points short, margin recurved above, upper cells r. flexuose; n. of 3 strata, about $\frac{1}{3}$ of base of leaf .....*brevipilus*

3 { Ls. auricled, dark-green, n. about $\frac{1}{3}$ width of base.....*atro-virens*
  { Ls. not auricled, olive-green, n. $\frac{2}{3}$ of base of leaf .....*introflexus*

4 { Ls. not auricled at base.....5
  { Ls. auricled at base w. swollen cells 8

5 { Ls. short, straight, rigid, entire; n. usu. of 4 strata 6
  { Ls. alm. setaceous, serrul. towards apex; n. of 3 strata.....7

6 { St. $\frac{1}{2}$ in., not radiculose; n. about $\frac{1}{2}$ base of leaf .....*subulatus*
  { Pl. taller, densely compacted w. tomentum; n. $\frac{2}{3}$ of base ...*Schimperi*

7 { N. about $\frac{1}{3}$ of base of leaf; ls. longly setaceous .....*pyriformis*
  { N. about $\frac{1}{2}$ base; ls. shortly setaceous, whitish below.....*fragilis*

8 { N. $\frac{1}{2}$ width or more of base of leaf 9
  { N. about $\frac{1}{3}$ of base.....11

9 { Ls. dense, alm. entire; st. w. a few radicles 10
  { Ls. distant, serrate above; st. tall, not radiculose.....*setifolius*

10 { Ls. gradually subul., margin inflexed alm. from base .....*Schwartzii*
   { Margin inflexed suddenly at $\frac{1}{4}$ length, in long subula .....*Shawii*

11 { Ls. suddenly subul. for $\frac{2}{3}$ length; n. excurrent .....*flexuosus*
   { Ls. short, gradually subul. for $\frac{1}{2}$ length; n. vanishing .....*paradoxus*

CERATODON.

1 { Ls. oblong-lanc.; n. not or sc. excurrent; caps. strumous...*purpureus*
  { Ls. ovate-lanc.; n. longly excurrent; caps. not strumous .....*conicus*

CYNODONTIUM.

1 { Caps. smooth, strumous at neck; ls. not papillose 2
  { Caps. furrowed; ls. papillose 3

2 { Ls. erecto-patent, lanceolate, semi-vaginant at base .....*virens*
  { Ls. spreading, suddenly subul. from dilated base .....*Wahlenbergii*

3 { Caps. not strumous at neck 4
  { Caps. strumous .....*strumiferum*

4 { Ls. lanc., r. obtuse, papillose; perich. ls. short.....*gracilescens*
  { Ls. acute, faintly pap. at back only; perich. ls. subul. ...*polycarpum*

DICRANELLA.

1 { Ls. oblong-lanceolate, obtuse, squarrose .....*squarrosa*
  { Ls. lanceolate-subulate; pl. usu. smaller 2

2 { Seta yellow 3
  { Seta red 4

3 { Caps. strumous at neck, ovate, sc. striate .....*cerviculata*
  { Caps. tapering, oblong, plicate when empty .....*heteromalla*

4 { Ls. subsquarrose, abruptly subul. from a sheathing base 5
  { Ls. erect or secund, more gradually subulate 7

5 { Caps. cernuous, smooth or substriate only 6
  { Caps. erect, striate, sulcate when dry .....*crispa*

6 { Ls. entire; caps. substriate, substrumous at neck.....*Grevilleana*
  { Ls. serrul. at apex; caps. smooth, equal at neck .....*Schreberi*

7 { Caps. striate, sulcate when dry; ls. slightly sheathing 8
  { Caps. smooth; ls. not sheathing 9

8 { Caps. cernuous; ls. entire; perich. ls. sheathing .....*subulata*
  { Caps. erect; ls. subserrul. at apex; per. ls. sc. sheathing .....*curvata*

9 { Caps. cernuous; ls. entire, erecto-patent or subsecund .....*varia*
  { Caps. suberect; ls. secund, serrul. at apex; cells wider .....*rufescens*

DICRANOWEISSIA.

1 { Ls. lanceolate-subul., narrow-pointed, entire; caps. oval .....*crispula*
  { Ls. linear-lanceolate, w. shorter subacute points.....2

2 { Ls. entire; caps. subcylindric; perist. t. alm. entire .....*cirrhata*
  { Ls. distantly toothed at apex; caps. oval-oblong; perist. teeth small, irregularly cloven .....*Bruntoni*

DICRANUM.

1 { Pl. rooting at base only, small (exc. *molle*); monoicous.....2
  { St. radiculose; pl. often larger; dioicous (the male plant being often minute, nestling in the tomentum) 6

2 { Caps. suberect, furrowed, neck tapering; seta short .....*fulvellum*
  { Caps. cernuous, neck strumulose when ripe; seta longer 3

3 { Pl. 2—5 in.; ls. straight, glossy; caps. oblong-cylindric.....*molle*
  { Pl. ½—2 in. high; ls. shorter and less silky 4

4 { Ls. flexuoso-patent; male fl. far below perichætium.....*schisti*
  { Ls. falcato-secund; male flower close below perichætium.....5

5 { Ls. w. few angular cells; caps. short, obovate .....*falcatum*
  { Angular cells distinct, coloured; caps. oblong-cylindric .....*Starkii*

6 { Ls. transversely undulate (caps. cernuous, curved).....7
  { Ls. not transversely undulate.....10

7 { Ls. w. upper cells long and narrow 8
  { Upper cells short, m. or l. quadrate or irregular 9

8 { Pl. firm; ls. recurved, w. long spinulose teeth above .....*undulatum*
  { Pl. weak, ls. w. saw-like teeth near apex only .....*Bonjeani*

9 { Ls. tapering to r. obtuse points, not papillose .....*Bergeri*
  { Ls. r. suddenly acuminate, papillose at the back of apex .....*spurium*

10 { Ls. suddenly narrowed near base to long setaceous points 11
   { Ls. gradually tapering to subulate points 13

11 { Ls. serrate above base, subula spinulose at back.....*asperulum*
   { Ls. w. basal wing entire, usu. falcato-secund 12

12 { Nerve ⅓ of base of leaf, subula smooth at back .....*uncinatum*
   { N. ⅓—½ of base, serr. at back; ls. pale green.....*longifolium*

13 { Ls. entire, or serrulate at extreme apex only 14
   { Ls. distinctly serrul. above (caps. cernuous, exc. *montanum*).....18

14 { Ls. falcato-secund .....(variety *curvulum* of) *Sauteri*
   { Ls. patent or subsecund 15

15 { Pl. small; ls. entire, nearly all broken across .....*viride*
   { Ls. not fragile; pl. usu. taller 16

16 { Pl. long, slender, w. dense tomentum: caps. cernuous .....*elongatum*
   { Pl. less compact; ls. m. or l. curled when dry; caps. erect.....17

17 { Plant under 1 in.; ls. serrulate at apex .....*flagellare*
   { Pl. taller; ls. entire, only slightly twisted when dry .....*Scottianum*

18 { Pl. short; ls. much curled when dry, papillose .....*montanum*
Pl. tall; ls. sc. curled, smooth or nearly so (exc. *fuscescens*) 19

19 { Setæ aggregate; nerve w. large central cells in 2 rows.....*majus*
Setæ solitary; n. w. central cells in 1 row or absent 20

20 { N. winged at back; upper cells long (caps. smooth) .....*scoparium*
N. not winged; upper cells short, quadrate or irregular 21

21 { Upper cells small, quadrate; caps. striate when ripe.....*fuscescens*
Ls. wider; cells larger, irregular; caps. smooth .....*congestum*

DIDYMODON with TRICHOSTOMUM.

1 { Ls. serr. above, squarroso-reflexed, oblong or ligulate 2
Ls. entire, or serrul. near apex only, usu. spreading 3

2 { Ls. not bordered, n. vanishing (in the type) .....*D. flexifolius*
Ls. w. yellowish border, n. excurrent in a mucro.....*D. recurvifolius*

3 { Nerve ceasing in or below apex 4
N. excurrent in a mucro (margin usu. plane or incurved) 8

4 { Ls. long, linear-lanc.; margin plane or nearly so 5
Ls. short, m. or l. lanc.; margin recurved below 6

5 { Ls. minutely crenulate only.....*D. cylindricus*
Ls. toothed at apex, fragile, margin sinuous above .....*D. sinuosus*

6 { Ls. acute or subacute; cells about 6—8 μ.....7
Upper ls. r. obtuse; cells about 10 μ or more .....*T. tophaceum*

7 { Monoicous; ls. lanc., lower ls. red; caps. cylindric .....*D. rubellus*
Dioic.; ls. short, ovate-lanc., rigid and imbric. when dry...*D. luridus*

8 { Basal hyaline cells not higher at margin than at centre 9
Basal hyaline cells ascending up margin of leaf.....11

9 { Ls. m. or l. obtuse, mucronate 10
Ls. gradually acumin., cuspidate, flat at apex .....*T. brachydontium*

10 { Ls. oblong-ligulate, short, recurved, flat at apex.....*T. litorale*
Ls. linear-lanc., margin incurved at apex, usu. cucull....*T. crispulum*

11 { Ls. soft, w. sheathing base, r. obtuse or cucull. .....*T. flavo-virens*
Ls. rigid, mostly broken, acute, n. glossy when dry.....*T. nitidum*

DISTICHIUM.

1 { St. 1—4 in.; ls. yellow-green; caps. cylindric, erect .....*capillaceum*
St. ½—1 in.; ls. dull-green; caps. ovate, cernuous .....*inclinatum*

DITRICHUM.

1 { Ls. squarrose, sheathing; caps. narrow-cylindric.....*tenuifolium*
Ls. erecto-patent or secund; caps. m. or l. oval or elliptic 2

2 { Ls. glaucous, mealy, linear-lanc., serrul. near apex .....*glaucescens*
Ls. yellow-green, subulate or setaceous 3

3 { St. tall, flexuose; ls. long, falcate, serrul. at apex .....*flexicaule*
St. short, straight; ls. patent or subsecund 4

4 { Lid conic, obtuse; annulus wide; dioicous .....*homomallum*
Lid shortly rostellate.....5

5 { Ls. serrul. at apex; n. sc. excurr.; annulus wide; dioicous.....*tortile*
Ls. entire; n. excurrent; annulus obscure; monoicous ...*subulatum*

ENCALYPTA.

1 { Ls. w. tapering acumen; cells 7—8 μ; perist. absent .....*commutata*
Ls. w. broader points, not tapering; cells 10—16 μ 2

2 { Pl. tall; ls. obtuse, r. cucullate; n. scabrous at back above; caps. w. spiral striæ; perist. double.....*streptocarpa*
Pl. smaller; n. sc. roughened at back; perist. absent or single.....3

3 { Cal. fringed at base; perist. present; caps. smooth .....*ciliata*
  { Calyptra not fringed at base.....4

4 { Caps. w. vertical striæ; perist. perfect .....*rhabdocarpa*
  { Caps. not striate; perist. usu. absent or rudimentary .....*vulgaris*

ENTOSTHODON.

1 { Ls. bordered; caps. short, obovate; perist. rudimentary ...*ericetorum*
  { Ls. not bordered; caps. clavate-pyrif.; perist. perfect.....*Templetoni*

EPHEMERUM.

1 { Ls. nerveless 2
  { Ls. nerved 3

2 { Ls. coarsely toothed; spores few, large (60—80 μ) .....*serratum*
  { Ls. entire or obscurely toothed; spores 24—30 μ .....*tenerum*

3 { Ls. broadly lanc., nerved to apex, serrate above 4
  { Ls. narrow, nerve excurrent.....5

4 { Nerve faint, wanting in lower half of leaf .....*intermedium*
  { Nerve distinct throughout .....*cohærens*

5 { Ls. lanc.-subul., tapering, alm. entire; nerve strong.....*stenophyllum*
  { Ls. linear-ligul., denticul. at apex .....*Ephemerella recurvifolia*

EURHYNCHIUM (*see Note to* RHYNCOSTEGIUM).

1 { St. ls. large, elliptic, w. long, fine points; st. pinn.....*piliferum*
  { Ls. m. or l. ovate or lanc., without hair-like points.....2

2 { Seta smooth; ls. m. or l. plicate (exc. *myosuroides*) 3
  { Seta rough; ls. not or only slightly plicate 7

3 { Ls. not plicate, acuminate; caps. suberect .....*myosuroides*
  { Ls. m. or l. plicate, especially when dry; caps. cernuous 4

4 { Brs. v. curved; ls. imbric. when dry; cells r. short .....*circinatum*
  { Brs. not circinate; ls. spreading or loosely imbric.....5

5 { Pl. robust; brs. straggling; ls. alm. squarrose, v. plic.....*striatum*
  { Pl. smaller; brs. m. or l. erect; ls. erecto-patent, less plic. 6

6 { Ls. acuminate, angular cells minute, opaque .....*striatulum*
  { Ls. v. short, upper ls. usu. r. obtuse, concave .....*strigosum*

7 { St. sub-bipinnate, w. paraphyllia; st. ls. v. decurrent, triangular, with longish acumen .....*prælongum*
  { St. ls. sc. decurrent; st. usu. less pinn.; paraphyllia absent.....8

8 { Pl. v. slender; ls. v. small, lanceolate, tapering 9
  { Ls. larger, more or less ovate 11

9 { Ls. broadly nerved alm. to apex, dark opaque green .....*Teesdalii*
  { Nerve slender, ceasing about $\frac{1}{2}$ or $\frac{2}{3}$ up the leaf 10

10 { Ls. ovate-lanceolate, cells r. wide; dioicous .....*pumilum*
   { Ls. lanc., clustered at ends of brs.; monoic. ...*Rhyncost. curvisetum*

11 { Ls. v. concave, acumin., serrul. above; n. thick .....*crassinervium*
   { Ls. less concave, usu. serrul. throughout, less acuminate 12

12 { Synoic.; pl. r. robust, v. bright green; ls. alm. flat .....*speciosum*
   { Monoic. or dioic.; pl. smaller, usu. dull or yellowish green 13

13 { St. creeping; brs. v. short, crowded, suberect .....*abbreviatum*
   { Brs. longer, more distant, usu. arched or straggling 14

14 { Br. ls. m. or l. complanate, usu. short-pointed .....*Swartzii*
   { Br. ls. acumin., not complan.; apical cells longer .....*hians*

FISSIDENS.

1 { Ls. with hyaline border (seta terminal).....2
  { Ls. without hyaline border 9

2 { Barren flower bud-like, in axils of the leaves 3
  { Barren flower basal or terminal 4

3 { Pl. small; border narrow; capsule m. or l. erect .....*bryoides*
  { Pl. larger; border thick; caps. subcernuous: aquatic .....*rivularis*

4 { Nerve excurrent in a long acute point .....*Orrii*
  { Nerve ceasing in apex 5

5 { Plant small; border narrow, colourless.....6
  { Plant larger; border strong, coloured.....8

6 { Caps. incurved, cernuous.....*incurvus*
  { Caps. symmetric, erect or inclined 7

7 { Pl. autoicous .....*viridulus*
  { Pl. dioicous, minute; upper ls. narrow, ensiform .....*pusillus*

8 { Ls. acute, border yellowish, apex crenulate .....(var.) *fontanus*
  { Ls. r. obtuse, n. and border orange, apex eroso-denticul. .....*rufulus*

9 { Pl. minute, w. only 3 or 4 pairs of ls. (seta terminal) .....*exilis*
  { Pl. r. tall, w. several pairs of leaves 10

10 { N. excurrent in apiculus: seta from base of stem .....*taxifolius*
   { Nerve ceasing below apex 11

11 { Ls. alm. entire, without any paler border 12
   { Ls. eroso-serr. at apex, w. broad paler zone at margin 13

12 { Ls. sc. 1 line long, minutely crenul.; seta terminal .....*osmundioides*
   { Ls. 2—3 lines, entire (exc. extreme apex); pl. tall .....*polyphyllus*

13 { Cells r. obscure, about 6—8 μ; leaf-border marked .....*decipiens*
   { Cells clearer, 10—12 μ; border usu. less marked 14

14 { Ls. m. or l. lanc., about 1—1½ line long; seta lateral .....*adiantoides*
   { Ls. ligulate, r. longer, usu. more serrate at apex.....*serratulus*

FONTINALIS.

1 { Ls. sharply keeled at back, m. or l. ovate-lanc. .....*antipyretica*
  { Ls. rounded at back, not keeled, lanceolate .....*squamosa*

FUNARIA.

1 { Caps. erect, symmetric; perist. rudimentary.....*fascicularis*
  { Caps. inclined, mouth oblique; perist. (usu.) double 2

2 { Seta straight; ls. w. long fine acumen .....*calcarea*
  { Seta arcuate when moist; ls. acute or shortly acuminate 3

3 { Caps. v. furrowed when dry, mouth large; lid convex...*hygrometrica*
  { Caps. less furrowed, mouth v. small; lid usu. mamill.....*microstoma*

GRIMMIA.

1 { Ls. strongly plicate, w. long hair-points; cal. plicate.....*cribrosa*
  { Neither calyptra nor ls. plicate 2

2 { Ls. all without hyaline points 3
  { Upper ls. w. hyaline points 6

3 { Caps. immersed 4
  { Caps. exserted; pl. usu. tall, blackish-green.....5

4 { Ls. w. revolute margin, m. or l. lanc. .....(vars. of) *apocarpa*
  { Ls. w. erect margin, narrow, n. strong; pl. small .....*maritima*

5 { Ls. obtuse, margin incurved above; st. denuded at base .....*unicolor*
  { Ls. subacute, margin erect or reflexed; st. leafy below.....*atrata*

6 { Caps. immersed or subimmersed.....7
  { Caps. exserted (exc. var. *sudetica* of *Doniana*) 10

7 { Seta straight; hyaline points short (exc. var. *pruinosa*).....8
  { Seta curved; ls. ovate or obovate, w. long hair-points 9

8 { Pl. small, dense, soft, dull-green ; perist. t. cribrose .....*conferta*
Pl. larger, loosely tufted, coarser ; per. t. subentire .....*apocarpa*

9 { Perist. absent; ls. ovate, with m. or l. toothed hair.....*anodon*
Perist. present; ls. obovate, w. alm. smooth hair .....*crinita*

10 { Hyaline points v. short, lower ls. often muticous 11
Upper ls. w. longish hair-points.....14

11 { Ls. much crisped or twisted when dry.....12
Ls. not (or scarcely) crisped or twisted 13

12 { Ls. v. curled when dry; basal cells shortly rectangul. .....*contorta*
Ls. spirally twisted; basal cells narrow, elongate .....*torquata*

13 { Upper ls. long, usu. secund, yellow-green, usu. w. gemmæ...*Hartmanni*
Pl. blackish below; ls. short, patent.....*elongata*

14 { Ls. oblong-lanc., contracted to long, v. rough hair .....*leucophea*
Ls. lanceolate, m. or l. tapering.....15

15 { Ls. w. basal cells rectangular, sc. thickened, not sinuous 16
Basal cells at centre of leaf long and narrow, incrassate, usu. m. or l. sinuous, often quadr. at margin 22

16 { Pl. r. loosely tufted (seta curved, or fruit unknown).....17
Pl. in dense cushions 18

17 { Ls. subsquarrose, margin recurved, hair r. rough .....*subsquarrosa*
Ls. narrow, patent, margin plane, hair-point smooth.....*Stirtoni*

18 { Seta curved; ls. r. suddenly contracted to a hair 19
Seta erect; ls. gradually tapering 20

19 { Caps. striated; lid beaked; calyptra mitriform.....*pulvinata*
Caps. alm. smooth; lid blunt; cal. cucullate .....*orbicularia*

20 { Lid conic, obtuse 21
Lid rostrate (cal. cucull.; lower cells short) .....*montana*

21 { Cal. mitrif.; caps. pale; ls. w. lower cells r. elongate .....*Doniana*
Cal. cucull.; caps. brownish; lower cells short .....*Ungeri*

22 { Seta curved when moist (ls. gradually acuminate) 23
Seta erect (hair-point smooth or nearly so)..... 27

23 { Hair-point v. rough 24
Hair-point smooth or slightly roughened only 25

24 { Pl. robust; caps. 8-furrowed; autoicous .....*Schultzii*
Pl. smaller; caps. alm. smooth; dioicous .....*Mühlenbeckii*

25 { Pl. tall, dull-green; margin revolute; upper cells opaque .....*elatior*
Pl. smaller, yellowish- or greyish-green; margin plane above 26

26 { Ls. spirally twisted when dry, v. narrow; pl. slender.....*funalis*
Ls. sc. twisted when dry, wider at base.....*trichophylla*

27 { Dioicous; lid rostrate; perist. t. broad, trifid.....*commutata*
Autoicous; lid rostellate; perist. t. narrow, bifid.....*ovata*

GYMNOSTOMUM with GYROWEISSIA.

1 { St. v. short; ls. lingul., obtuse, w. plane margins 2
St. usu. longer; ls. linear-lanc., m. or l. acute or subacute 3

2 { Ls. alm. entire; annulus wide; in deep-green tufts.....*Gyrow. tenuis*
Ls. crenulate; annulus v. narrow; in pale-green mats .....*calcarium*

3 { Ls. w. plane margin, subacute; upper cells minute, opaque...*rupestre*
Margin recurved at middle; upper cells larger, pellucid 4

4 { Cells long at base, quadr. and oval above; ls. lanc. .....*curvirostrum*
Cells all elongate and pellucid; ls. narrower .....*commutatum*

(To be continued.)

PLANTS FOUND IN KERRY, 1890.

By Reginald W. Scully, F.L.S.

The cold and wet summer of last year was most unfavourable to botanists in Kerry, driving storms of wind and rain sweeping over this exposed county, day after day. A week spent in the neighbourhood of Dingle, towards the end of July, unfortunately coincided with the worst of the bad weather, and though occasional glimpses of the fine range of cliffs at Brandon were obtained, mountaineering work was practically impossible; indeed, the sodden bogs and moorlands, with their swollen and almost impassible streams, were found quite bad enough.

Very few plants new to District I. of the *Cybele Hibernica* were found during the past season, *Hypopithys multiflora*, a very rare plant in Ireland, being the only addition of interest; a few were also added to the Co. Limerick list, which comes under Dist. VI. of the *Cyb. Hib.* Fresh localities were, however, found for several of the rarer Kerry plants, among these being *Juncus tenuis* and *Nitella gracilis*. The *Juncus*, already noted in two localities (*Journ. Bot.* 1889, p. 335), was discovered growing beside the road between Kenmare and Glengariff, the well-known tourist route. It occurred here in some plenty, both by the road-side and over a stony waste adjoining, used for storing road-metal, &c.; the locality is about eight miles from Kenmare, and its elevation about 400 ft. This is very much higher than either of my previous Kerry records, while it lies fully five or six miles from the nearest sea. It was within a mile of this locality that I had the good fortune to stumble upon two specimens of the rare slug, *Geomalachus maculosus*, hitherto only known from Caragh Lake, about twenty miles away; they both occurred close by the road-side, which here attains an elevation of over 600 ft. When at Kenmare, last August, I took the opportunity of going more thoroughly over the 1889 station for this plant, west of the town. I found the *Juncus* to be in vast abundance here, growing over an area of about $\frac{3}{4}$ mile N. and S., by $\frac{1}{4}$ mile E. and W., being especially plentiful in wet marshy spots near the sea. Turning inland, the *Juncus* occurred in more or less plenty across poor rocky pastures, gradually thinning out as the sea was left and the cottages approached. Both marshy spots and rocky pastures were crossed and intersected by a web of cow-tracks and faint paths, and it was along these that the *Juncus* especially flourished, being indeed practically confined to them. Though this suggests a possible introduction with cattle-fodder, a narrow lane-way which runs through these pastures to the neighbouring cottages was followed without a solitary plant being seen. The known predilection of this plant for tracks and road-sides could not be better exemplified than in this and its other Kerry localities.

Before giving a list of new localities, I must again refer to the River Laune Potamogetons mentioned in my Kerry Notes (*Journ. Bot.* 1890, p. 110). Two short visits were paid to this river last August; one to its exit from the Lower Lake, Killarney; the other

to Killorglin, where the Laune becomes tidal. At the exit of the river from the lake, *P. perfoliatus*, *P. heterophyllus*, and *P. nitens* var. *salicifolius* are very abundant, and grow mixed together; of the the last-named form a plant or two was gathered so near to *P. perfoliatus* that many, I fancy, would hesitate before referring it to one or the other. About half-a-mile down the river the curious form which Mr. Arthur Bennett calls *P. nitens* var. *latifolius* Tis. was first noticed growing in dense masses with *P. perfoliatus* and *P. nitens* var. *salicifolius*. This var. *latifolius* appears much nearer to *P. perfoliatus* than to *nitens* or *heterophyllus*, and might, when growing, be easily passed over as a very luxuriant growth of the former, of which it has, moreover, the short stout flowering spikes. No trace of fruit could be found, though the plant flowers abundantly. I have little doubt that this var. *latifolius* is a hybrid form between *P. perfoliatus* and probably *nitens*.

My second visit to Killorglin, about sixteen miles by the Laune from the Lake, was to gather the long narrow-leaved form thought by Mr. Arthur Bennett to belong to *P. Zizii*. Neither *P. heterophyllus* nor the vars. *salicifolius* or *latifolius* of *nitens* were here noted; all having apparently disappeared, their place being taken by this form of *P. Zizii*, which grew abundantly, again mixed with *P. perfoliatus*. Most of the flowerless *P. Zizii* plants throw out two or three long narrow coriaceous floating leaves, while the stems that produced the few flowering spikes seen were usually without these coriaceous leaves. As Mr. Bennett points out, *P. lucens* seems to enter into the parentage of the Killorglin plant, and suggests as possible the very formidable combination of "*heterophyllus* × *perfoliatus* × *Zizii*, or *heterophyllus* × *Zizii*," *Zizii* being usually, I think, regarded as a hybrid itself. Another difficulty in regard to this plant is that, so far, *P. lucens* does not appear to be among the Laune Potamogetons, though, as the river is too broad and deep to be satisfactorily examined from the bank, one cannot be sure that it does not occur in the sixteen miles of water. Where the vars. *salicifolius* and *latifolius* end, and the *P. Zizii* form begins, or whether they overlap each other, I cannot yet say. Neither on this plant could fruit be found, and I much doubt if it or the vars. above referred to produce any.

In the following list, plants followed by I. or VI. are additions to these districts of the *Cybele Hibernica* and its Supplement:—

Ranunculus Lenormandi F. Schultz. Shows decided local tendencies in Kerry, and seems to prefer the mountainous portion of the county.

Glaucium flavum Crantz. Shores of R. Shannon, east of Letter Point; its second Kerry locality.

‡*Chelidonium majus* L. Several localities east of Kenmare, and sparingly at Ballyseedy, Tralee.

‡*Fumaria confusa* Jord. Seems the commonest of the Kerry *Fumariaceæ*, though *F. pallidiflora* is not rare. Both are colonists.

Arabis ciliata R. Br. It is hard to understand what is meant by this as a British plant. It does not occur apparently anywhere else along the shores of Western Europe, and, as *A. sagittata* is known

to be a very variable plant, I have little doubt that *A. ciliata* is scarcely worthy of varietal, much less specific, rank. — *A. sagittata* DC. A monstrous form was gathered by Barrow Harbour in some plenty, in which the whole plant, stem, leaves and pods, was covered with a dense whitish pubescence.

Subularia aquatica L. Found floating in L. Camclaun, Connor Hill.

‡*Brassica alba* Boiss. Several places about Tralee; rare in Kerry.

‡*Lychnis alba* Mill. Field near Fermoyle, Castlegregory.— ‡*L. Githago* Lam. With crops near Dingle and Castlegregory; both plants very rare in the county, and colonists only.

‡*Althæa officinalis* L. Widely distributed, usually in cottage gardens or hedges, and I do not know of any locality where it is certainly native.

Euonymus europæus L. About Kenmare; Listowel, &c.

†*Ononis repens* L. Several places about Castlegregory, and near an old castle on road from Ventry to Smerwick; very rare in Kerry, and localities suspicious.

Trifolium striatum L. Limestone rocks at Rahaneen, near Ardfert.—*T. filiforme* L. Near Kenmare, and by Shannon at Kilelton.

†*Vicia hirsuta* Koch. Shows a marked preference for the vicinity of old churches, castles, &c., though not a common plant in the county.

**Rosa micrantha* Sm. Near churchyard west of Tarbert.

**Sedum Forsterianum* Sm. Walls near Tarbert.

Callitriche obtusangula Le Gall. I. Abundant in Glanooragh stream north of Killarney, and in ditch west of Tralee.

Pimpinella Saxifraga L. By R. Feale, near Listowel; a rare plant in Kerry.—*P. major* Huds. Much more abundant than last; new localities are, road-side between Killorglin and Glencar; near Ventry; Ballylongford, &c.

Anthriscus sylvestris Hoffm. Along the R. Maine. The rarity of this plant in Kerry has been before referred to.

†*Caucalis nodosa* Scop. Widely scattered, but not a common plant.

Galium uliginosum L. Swamp by Glanooragh River, north of Killarney.

†*Dipsacus sylvestris* L. For about a mile along R. Shannon, east of Letter Point; the only Kerry locality at present known to me.

Filago minima Fr. Bed of mountain stream, west of Castlemaine.

**Artemisia Absinthium* L. Old churches and road-side at Stradbally and Killiney, near Castlegregory; the only Kerry locality I know of.

Cnicus pratensis Willd. Very rare in the south of the county; common in the north.

**Crepis biennis* L. VI. Field-side in Co. Limerick, a little east of Tarbert.—*C. paludosa* Moench. Rocky banks of R. Feale, Listowel.

Hieracium anglicum Fr. Cliffs in Ballochbreama, Glencar and Kerry side of Glengariff Tunnel. — *H. umbellatum* L. Abundant along Caragh River, Glencar.

Hypopithys multiflora Scop. I. Under beeches west of Muckross Abbey, Killarney.

Statice rariflora Drej. Shannon shore at Tarbert and Kilelton; Ballylongford.

Lysimachia vulgaris L. By R. Brick, near Lixnaw; Fermoyle, west of Castlegregory, found by the Rev. Abm. Isaacs.

Gentiana campestris L. Not rare between Killorglin and Glencar, &c. I have not yet seen *G. Amarella* in this county.

Utricularia neglecta Lehm. By shore below Lakeview, Killarney; its second Irish locality.— *U. intermedia* Hayne. Not a rare plant in the southern half of the county,

Pinguicula grandiflora Lam. Mountain glens between Castleisland and Listowel. This is north of the line marking the range of this plant in the map of the *Cybele Hibernica*.

‡*Mentha rotundifolia* L. Abundant by stream at Fibach Bridge, west of Castlemaine; by old road through Glencar Woods; below Lakeview, Killarney; and near Kenmare. — **M. Piperita* Huds. Several localities east of Kenmare. — *M. Pulegium* L. Road-side south of Tarbert.

Euphorbia hiberna L. Very abundant along the R. Feale from Listowel to Abbeyfeale, and along its tributary, the Smerlagh. The spurge showed little signs of thinning out at Abbeyfeale, in Co. Limerick, where I finished for the day. Hitherto the only record for Limerick rested on the authority of K'Eogh, who stated in 1736 that the spurge grew abundantly near Anakirk. However, neither Anakirk nor the spurge have been found in the county for the last 150 years, and I have much pleasure in showing that K'Eogh was most probably correct in his record, though Anakirk is undoubtedly a misprint or error of some sort. Besides restoring this spurge to the Co. Limerick flora, Dist. VI. of the *Cyb. Hib.*, this will also extend the line in the map, already referred to, marking the northern limit of this plant.—*E. portlandica* L. Occurs on most of the sandhills round the Kerry coast.

Neottia Nidus-avis Rich. Woods at Tarbert.

Spiranthes antumnalis Rich. By R. Finnehy, west of Kenmare.

Epipactis palustris Crantz. By small pool south of Tarbert, with *Habenaria conopsea* and *Eriophorum latifolium;* rare plants in the county.

†*Sisyrinchium angustifolium* Mill. I paid a second visit last year to the Milltown locality for this plant, and found it to extend over a very limited area, perhaps fifteen yards by ten; from what I could learn, the *Sisyrinchium* does not appear to be spreading here. Two new localities were also found for this plant, which, if not in flower,—and they open only in bright sunshine,—is most easily overlooked. One of these new localities was a poor mountain slope, cut up into rough paths connecting small clusters of cabins half-a-mile apart; two small isolated patches only were noticed here. The second locality was beside the R. Laune just above Killorglin; here, again, very little of the plant could be seen, though what there was grew much finer and more luxuriant than in either of the previous stations. So far as is yet known, the Kerry range of

this plant is confined to the vicinity of Castlemaine Harbour, the almost landlocked extremity of Dingle Bay. Not one of these three localities is actually on the sea-coast, being respectively about one, three, and five miles from the nearest shore. This *Sisyrinchium*, with one or two other plants, are Kerry puzzles, and I prefer to see more of their distribution before hazarding an opinion as to their being introductions in the county, or otherwise.

Allium vineale L. VI. By the Shannon, near Loghill, east of Glin, Co. Limerick.

Potamogeton rufescens Schrad. Ditch by R. Brick, Lixnaw.— *P. prælongus* Wulf. Near Muckross boat-harbour, Lower Lake, Killarney; south end of L. Acoose, Glencar.

Ruppia spiralis Hartm. Brackish ponds by Barrow Harbour.

Carex disticha Huds. Ventry, and near Lixnaw; apparently rarer in Kerry than in most parts of Ireland. — *C. muricata* L. Limestone rocks below Fenit House, Tralee Bay; one of the rarer of the Kerry sedges. — *C. Goodenowii* b. *juncella* Fr. By L. Camclaun, Connor Hill. — *C. pendula* Huds. Abundant by river in Ballinruddery Woods, near Listowel; probably planted.—*C. strigosa* Huds. In damp wood, north side of river, near Listowel. — *C. punctata* Gaud. Base of cliffs, near sea-level, east side of Ventry Harbour. — *C. filiformis* L. Abundant near the railway where it crosses the R. Brick, near Lixnaw. — *C. riparia* Curtis. Widely scattered over county.

Milium effusum L. Sparingly in Ballinruddery Woods, Listowel; and in Fermoyle Woods, west of Castlegregory.

Melica uniflora Retz. Woods, north side of river near Listowel; a rare plant in Kerry.

Lepturus filiformis Trin. Abundant by Shannon, west of Ballylongford.

Adiantum Capillus-Veneris L. This fern is recorded in the Supplement to the *Cyb. Hib.* as occurring in the sea-wall below Mt. Trenchard, west of Foynes, Co. Limerick. At the date of my visit to this locality, early in July, I found that a fine cut stone rampart with every chink carefully filled up with cement had all but replaced the old sea-wall; the few remaining yards of this crumbling wall, long since pulled down, were searched without success, and I am afraid the plant, for the present at least, must be erased from the Co. Limerick list.

Lastrea Oreopteris Presl. Common in the mountain glens about Connor Hill and Camp; in a glen west of Castleisland.

Equisetum sylvaticum L. Connor Hill; glens west of Castleisland; near Listowel, &c.; not common in Kerry.

Lycopodium clavatum L. Found creeping among moss on one of the summits of Mangerton; marked 2568 ft. in the inch Ordnance maps.

Chara vulgaris v. *longibracteata* Kuetz. Near Castlegregory, &c.

Nitella gracilis Agardh. A second Irish locality for this plant was found in a boggy bay on the Muckross shore, Lower Lake, Killarney; it occurred there abundantly over a somewhat limited area, usually mixed with some of the larger *Characeæ*.

In my Kerry Notes, *Journ. Bot.* 1890, p. 111, I have recorded the finding of *Polygonum arifolium* near Derrynane. The prickly *Polygonum* in question should have been called *P. sagittifolium*, and not *P. arifolium*, which has smooth stems, &c.

My thanks are again due to Mr. Arthur Bennett, Messrs. Groves, and Mr. A. G. More, for their kindness in looking over some doubtful plants.

PROF. HENSLOW ON "ENVIRONMENT."

By the Editor.

The Rev. Prof. Henslow, in the April number of *Nature Notes*, puts forward the theory of "environment" as an "origin of species." "All I contend for is," he says, "that characters which botanists seize upon by which they recognise varieties or species, are due to the response of the individual to its environment"; and he adduces various examples which he considers support his contention.

We express no opinion as to Prof. Henslow's theory, which is not a new one, but we must take serious exception to the statements which he brings forward in support of it. He says: "*Ranunculus tripartitus* is regarded as a species, but when *R. heterophyllus* grows on mud it sometimes cannot be distinguished from the former." This view will hardly be accepted by critical British botanists. Prof. Henslow contrasts the book-characters of certain allied species, *e.g.*, of *Salix herbacea* and *S. reticulata*, and points out that these characters are of little value; and he does the same for *Geranium molle* and *G. rotundifolium*. But who that knows the two willows could mistake the one for the other? Who, save the merest tyro, could confuse *G. molle* with *G. rotundifolium?*

But let us examine Prof. Henslow's account of *Erythræa Centaurium*. Here is what he says about it:—

"*Erythræa Centaurium* is a species which appears to perplex systematists. Hooker made four subspecies, while Babington makes five species, and Wyman [Nyman] seven. Of Hooker's subspecies *latifolia*, he records 'shores near Liverpool' as a locality; *E. chloodes*, a variety of the subsp. *littoralis*, is found on 'sandy shores N. to Shetland.' Subsp. *pulchella* is found on 'sandy ground from Dumfries and Haddington southward,' while var. *E. tenuiflora* occurs in 'the Isle of Wight,' and the subsp. *capitata* grows 'on the Downs of the Isle of Wight and Eastbourne.'

"Now, besides noting more particularly the environments of these subspecies, it would be a great boon to science if local botanists would collect the seed and sow it in a different soil and locality, and see how far the subspecies and varieties retained their characters by heredity, or whether they did not change and pass one into another as soon as their environments were altered. Thus *E. capitata*, which is a dwarfish form, like all 'Down' plants, might assume the typical form common in pastures if grown in the richer soil of a good meadow or garden."

There is an airiness about the last paragraph which is a little astonishing. "Local botanists" would be only too glad to "collect the seed" of *Erythræa latifolia*—a plant which, so far as we know, has not been found since 1854 or thereabouts in its only known locality, the Lancashire sand-hills. But *E. capitata!* Surely Prof. Henslow, who is laudably anxious for "observations and experiments," is not unaware of the unusual interest attaching to this plant, which has been the subject of careful investigations by Mr. Townsend, and of the experiments which have been made upon it.

In the first place, the plant differs structurally from all other members of the genus "by its almost free stamens, the filaments of which, without exception, [Mr. Townsend] found to be attached only at the base of the corolla-tube, and to be otherwise perfectly free within it." Other points of difference in habit and structure, extending from its earliest to its latest growth, from the seedling to the fruiting stage, are all duly chronicled in the careful and exhaustive accounts given by Mr. Townsend in the *Journal of the Linnean Society*, xviii. 398 (from which the above sentence is quoted); in this Journal for 1879, 327; 1881, 87, 302; 1884, 27; and in his *Flora of Hampshire*.

But it may be said that the very distinctness of the plant bears testimony to the influence of its environment. This can hardly be the case, for Mr. Townsend tells us that on the Isle of Wight downs "it grows in company with densely-flowered compact forms of both *E. Centaurium* and *E. pulchella* of a similar height" (Journ. Bot. 1879, 327); and the two forms also occur on the Sussex downs.

Prof. Henslow, who dismisses this distinct and interesting species as a "dwarfish form, like all 'Down' plants," tells us that it "might assume the typical form common in pastures if grown in the richer soil of a good meadow or garden." It might, but it doesn't. The plant has been raised from seed, or young examples naturally sown have been cultivated, at Kew and at Cambridge, as well as by Mr. H. C. Watson and others, including Mr. Townsend, whose careful observations on the specimens which he raised have enabled him to record further points of difference between this and allied species.

Prof. Henslow seems to think that this mode of testing the constancy of forms is a new suggestion. He can hardly be aware how generally it is pursued: our pages from time to time (as on p. 119) contain notes based on these experiments, and the value of M. Jordan's critical species rests mainly on his work in this direction. The value of the critical notes of the Rev. E. S. Marshall, Mr. Arthur Bennett, Mr. F. J. Hanbury, and many more is largely due to the careful observation of plants under cultivation.

We are not concerned with the remainder of Prof. Henslow's article, although it contains much that provokes criticism. But we cannot refrain from protesting against the promulgation of theories, irrespective of facts, which has become in too many instances a substitute for "observation," and is unsupported by "experiment."

THE NOMENCLATURE OF POTAMOGETONS.

By Arthur Bennett, F.L.S.

(Continued from Journ. Bot. 1890, p. 302.)

The name *mucronatus*, as applied to the *P. pusillus* var. *major* of Fries, presents some difficulties. Some authors (Dr. Almquist in Hartman's Scand. Fl. new ed., as a late example) refer to Roemer and Schultes Syst. 3 (1818) for the name, but they merely say (p. 517), "quid *P. mucronatus* Schrad." and in their third Mantissa, p. 367 (1827), remark, "*P. mucronatus* Schrad., ut fertur, *cornutus* est. Mert. et Koch in Röhl. Deutsch. Fl. p. 860." Mertens and Koch's note is "quid *P. mucronatus* Schrad.?, dies soll, wie wir hören, *P. cornutus* seyn, aber gewiss wissen wir das auch nicht."

Others refer to Sonder's 'Flora of Hamburg,' but he merely takes up the name. Even Koch, in his Syn. Fl. Germ. et Helv. ed. 2 (1843–45), does not mention *mucronatus*, although he has (under *natans*, *β. prolixus*), "*P. serotinus* Schrader in litt. ad amicos." Steudel has "*P. lucens mucronatus*." Whether Presl, when he named a plant from the Philippine islands as "*mucronatus*," in 1849, had any knowledge of Reichenbach's 7th volume of the 'Icones' it is difficult to say; probably he would ignore the name as applied to *pusillus* var. *major*, using *compressus* instead. The date usually given for Reichenbach's 7th volume is 1845, but Ruprecht (1845), in his description of *Friesii*, notes Reichenbach's using *mucronatus*, so it is evident that the 'Icones' must either have been published before Ruprecht's, or that the author had communicated his ideas by letter. If Presl had knowledge of *mucronatus* Schrad., it is curious he did not add to his description "non Schrader," as is usually done.

In none of Schrader's works can I find any reference to the name. There may be at Gottingen some MSS. of the 2nd vol. of the Fl. Germanica that Smith (1828) notes he has not received, though it would seem that Schrader must have made some preparation for it, as Smith quotes "*P. cuspidatus*," which we find first in Smith's work. If there exist in Reichenbach's herbarium specimens named *mucronatus* by Schrader before the 7th vol. of the 'Icones' was published, it will verify the plant as not being a *lucens* form (that is, if they prove *pusillus* var. *major*). There can be very few months' difference between the time of the publication of the 'Icones' and Ruprecht's name, and at present it seems better to use *P. Friesii* as a certainty as to the plant meant than *mucronatus* as an uncertainty. One significant fact may be noted; Chamisso, in 'Linnæa,' vol. ii. (1827), makes no mention of *mucronatus* in his excellent account of the genus. Further light is wanted on it.

When specimens of *P. Friesii* are not in fruit, it is not always easy to separate them from *P. obtusifolius* Mert. et Koch. In *Friesii* the nerves are mostly five, but I have seen seven; in *obtusifolius* they are usually three, but in specimens from Methye Lake, British N. America (lat. 57° 30″), there are seven. The habit of *R. Friesii* usually makes it easy of recognition, but there

are exceptions to this. Sometimes this is misnamed *acutifolius*, but these two plants are easily separated, even by single leaves.

P. ANGUSTIFOLIUS Presl. (*P. Zizii* Roth.), var. METHYENSIS mihi (*P. Zizii*, Macoun's Cat. of Canadian Plants). Collected by Mr. J. M. Macoun, at Methye Lake, north of Buffalo Lake, lat. 57 30″, in the Hudson's Bay Company's territory. The situation of this lake is well shown on one of the maps of Franklin's Journey to the shores of the Arctic Sea. Differs from any form of the type in America or Europe by the long narrow middle leaves; the upper leaves are oval, semi-coriaceous, with long stipules, combining the habit of *longifolius* Gay, and the *lucens*, No. 607 of the Herb. Fl. Ingricæ; fruit smaller, and the embryo more curved.

P. PUSILLUS L., var. ELONGATUS mihi, Macoun's Cat. of Canadian Plants, pt. 5, p. 371 (1890).—This differs from *pusillus* by the larger size of all its parts, very long internodes, leaves remarkably elongated, peduncles stout and long, spikes much longer, the leaves are often quite acute, flowers larger in all their parts. Habit of *rutilus* Wolfgang, and so named in specimens from Hungary in Herb. Mus. Brit.! One can understand Dr. Richter's having referred such a plant as this to *rutilus* (to include *Friesii*), as he does in his 'Plantæ Europeæ,' 1890, p. 15. Spallumsheen River, at and above Enderby, British Columbia, 1889. J. M. Macoun!

P. ACUMINATUS Schum. En. pl. Saell. p. 49 (1801).—This in our Floras is named *P. lucens* L. var. *acuminatus* Schum., sometimes within brackets; but its first application as a varietal name seems due to Fries, in the first edition of his Nov. Fl. Suec. The references to the plant are:—

P. lucens var. *acuminatus* Fries, *l. c.* p. 46 (1816).
P. cornutus Presl. Fl. Cech. p. 37 (1819).
P. lucens β. *macrophyllus* Wallr. Sch. crit. i. 65 (1822).
P. volhynicus Besser, En. Pl. Volhy. p. 52 (1822).
P. caudatum Seidl. Opiz. Böh. Gew. p. 23 (1823).
P. lucens L., var. *diversifolius* Mer. et Koch, Deut. Fl. p. 849, 1823 (f. Fieber).
P. lucens β. *cornutus* Presl. Kosteletzky, Cl. Anal. Fl. Boh. p. 24, 1824.
P. lucens α. *corniculatus* Meyer, Chl. Hann. p. 522 (1836).
P. corniculatus Schur. En. Pl. Trans. p. 633 (1866).

P. COLORATUS Hornem. Fl. Danica, fasc. 25, t. 1449 (1813).—It seems necessary to point out that as Dr. Almquist, in the 12th edition of Hartman's Hand. i. Skan. Fl. (1890), uses the name *P. plantagineus* Du Croz (1818), he has evidently been misled by the date 1823 being printed on the first page of fasc. 25 of the 'Flora Danica.' This is, however, a misprint, as can be seen by referring to the other fascicles in the volume, where the date 1818 occurs *after* the misprint 1823. Dr. Lange correctly gives the date in his Nomencl. Fl. Danicæ, yet has the same error as Dr. Almquist in his Hand. i. den Danske Flora.

It is a curious fact that Hornemann did not know the plant he published; specimens so named by him are *polygonifolius*!. Hoff-

man-Bang and Vahl were the real authors of the plant, but not its publishers. Perhaps this was what led Dumortier to re-name the plant.

P. TENUIFOLIUS H. B. K. Nov. gen. et sp. i. p. 297 (1815).—This is merely a form or perhaps variety of *P. pectinatus* L. (there is a var. *tenuifolius* Mer. et Koch, Deut. Fl. 1823, of *pectinatus*). *P. tenuifolius* F. Philippi in herb. Berlin et litt! is a good species, dispersed over South America as far south as Cordoba, in the Argentine Republic (Hieronymus!), which Prof. Philippi will, it is to be hoped, describe.

What *P. tenuifolius* Rafinesque, Medical Reports ii. 46 (1811), may be, it seems impossible to say (I know of no specimens in Europe or America), unless it can be shown conclusively what he meant by the reference "*P. lucens* Michx. fl. bor. Amer. nec non Linn."

Rafinesque's names have seldom been taken up by recent authors, but where his references and descriptions point to some specimens that can be examined and shown to be his plants, they must be restored on the ground of priority, notwithstanding the ridiculous extent of his plant-naming of after years.

(To be continued.)

TWO NEW AUSTRALIAN ORCHIDS.

By R. D. FITZGERALD, F.L.S.

ADELOPETALUM, gen. nov. — Sepals nearly equal, the lateral ones connate with a projection of the column. Petals absent. Labellum thick, attached to the basal projection of the column, near the end, entire and contracted into a claw, but not articulate. Column short-winged and toothed at the top, and with a gland-like enlargement just below the tooth. Anthers terminal, capping the pollen-masses. Pollen-masses 2, globular, cohering, above a small rostellum, but not connected with it. Flowers reversed, numerous, terminal on filiform peduncle, which issues from below the pseudo-bulb. Small bracts at the bases of the pedicels, larger and leafy on the peduncle. Herbs with creeping rhizomes connecting one-leaved conical furrowed pseudo-bulbs.

Adelopetalum bracteatum, sp. n. — Rhizome creeping, forming a mass. Pseudo-bulbs globular or conical, with six or seven vertical ridges, much marked after the leaves fall off. Leaves solitary on the pseudo-bulbs, oblong, channelled along the centre, thick, contracted at the base, ¾ in. long by ½ in. wide. Peduncles filiform, from 1½ to 2 in. long, bearing 8–10 leafy bracts, irrespective of the bracts below the flowers, and about 12 flowers on short pedicels. Bracts on peduncle lanceolate, acute, transparent, colourless, 2 lines long, 1 line broad. Flowers reversed, without spur, yellow-striped, and blotched with red. Lateral sepals broadly lanceolate-acuminate, 3 lines long, united for 1 line. Dorsal sepal

rather shorter. Labellum yellow, 1 line long, thick, hollowed above and thickened at the point, attached to the column, near the end and above the junction of the sepals, by a short claw. Column free for 1 line, adnate to the lateral sepals for 1 line. Wing of column having one tooth close to the anther, and below it a globular gland-like swelling (possibly abortive anthers). A small globular rostellum far back in the deeply sunk stigmatic chamber, below the overhanging pollinia. Pollen-masses 2, globular, cohering, not furrowed.

Sarcochilus eriochilus, sp. n. — Stems very short, forming a dense patch. Leaves linear, thick, channelled, acuminate, spotted, from 1½ to 2½ in. long. Peduncle filiform, reaching 4 in. long, bearing several very small acute bracts at intervals of about ¼ in., and about six white flowers on pedicels of about ¼ in. Sepals ovate-oblong, 2–3 lines. Petals rather smaller. Labellum about 1 line long, articulate on the end of the projection of the column. Lateral lobes white, triangular, blunt, 1½ line long, densely covered on the inside with hair. Middle lobe very short, about ¼ line, composed of two cups, the hollows turned inwards and filled with hairs, longer than those on the lateral lobes. A heart-shaped yellow spot on the disc, in the centre of which are two clavate glands, and on each side on each lateral lobe four glands, one much larger than the others, and clavate. The basal projection one and a half the length of the other portion of the column. Caudicle long, three times the diameter of a pollen-mass.

Both plants have been found at the Tweed River, New South Wales.

SHORT NOTES.

Growth of Lycopodium (p. 122).—The peculiarity in the mode of growth of *L. alpinum*, noted by Mr. Mennell in Wales, was last year observed by me to occur in another species, viz., *L. clavatum*. This was on the side of Irton Fell, in Cumberland, between Wastwater and the coast. The rings were of various shapes, some being nearly perfect circles, others almost the shape of the "club" in ordinary playing-cards. The appearance was so peculiar that I went a considerable distance out of my course to ascertain the cause.—Percy H. Grimshaw.

Ulex Gallii in Dorset.—The Rev. E. F. Linton states (p. 79) that *Ulex Gallii* Planch. is "not given in the *Dorset Flora*." I have asked him to correct this statement, and have referred him to p. 91 of my *Flora*, where *U. Gallii* is mentioned as "common on the chalk and greensand strata of the county." He declines to do so until he can by future observation confirm my view that *U. nanus* Sm. is prevalent on the heaths. Mr. Linton fails to see that my contention is not as to the prevalence of one species over the other, but, whether or not *Ulex Gallii* is omitted in my *Flora*. I will not trouble you with any remarks on Mr. Linton's contention

that the dwarf forms of *Ulex* on our heaths are those of *Gallii*, and not of *nanus*, in which opinion he writes me he is strengthened by a recent walk over the heath district between Poole and Bournemouth. At this time of the year, when the flowers and seeds of both species have passed away, it is somewhat difficult to compare the calyx-bracts with reference to the pedicels of the flowers, and the relative sizes and shapes of the floral standards and wings of the two species. The brush-like terminal shoots of *U. Gallii* do not occur in *U. nanus*. — J. C. Mansel-Pleydell.

Potamogeton javanicus Hassk. and P. tretocarpus Maxim.— In justice to the late Prof. Maximowicz I ought to have added on p. 122 the localities in Japan in which he gathered *P. javanicus*, *i. e.*, Simibara, Kuisin; Nippon, and Nagasaki (distributed under the name of *P. hybridus* Michx.). In a letter from him, a few months before his death, he mentions that he had distributed to several public herbaria specimens of a Japanese *Potamogeton* under the name of *P. tretocarpus*, before the receipt of a letter from me calling his attention to the fact that it was conspecific with *P. maliana* Miq. It may be well to give here the references to it:—

P. lucens L.; Cuming, No. 1381 (1839); Rolfe, Journ. Bot. 1886, p. 60.
P. mucronatus Presl; Epimel. Bot. p. 245! (1849).
P. maliana Miq.; Ill. fl. Arch. Ind. p. 46! (1871).
P. Wrightii Morong; Bull. Torr. Bot. Club, t. 59, p. 158! (1886).
P. tretocarpus Maximowicz ined.

Maximowicz refers to this plant in Frag. ad fl. As. or. cognit. mel. 59, and there notices the identity of Cuming's No. 1381, and Teysmann's No. 6763, from the Malay Archipelago; and Dr. Hance, in this Journal (1885, p. 329), says (noticing a plant gathered by the Rev. R. H. Graves at Lien-chau), "I have little doubt that this is identical with the plant referred to by Maximowicz (*l. c.*) as found at Peking, in the Philippines, and the Malay Archipelago." The name it should bear must at present remain doubtful, until "*P. mucronatus* Schrad." (1844) is cleared up; otherwise Presl's name would have to be used.—Arthur Bennett.

NOTICES OF BOOKS.

The Ferns of New Zealand and its immediate Dependencies, with directions for their collection and cultivation. By H. C. Field, C.E. London: Griffith, Farran & Co. 1890. 4to, pp. 164, 29 plates. Price £1 1s.

The author of the present work possesses a thorough, practical knowledge of the Ferns of New Zealand. He has lived many years in the Colony, and in following his profession of a civil engineer has travelled extensively, and been engaged in surveys and road-making. He has made ferns a subject of special study, not only in their native localities, in the woods, but also under cultivation in

his garden at Wanganui. Our readers will remember the excellent paper which he contributed to this Journal in 1878 (p. 363); and it is very satisfactory to have the complete results of his experience made available for easy reference.

The book is intended specially as a handbook to be used in the Colony, and is planned upon the same general lines as Newman's *Handbook of the British Ferns* and Eaton's *Illustrated Manual of the Ferns of North America*. It does not include the *Lycopodiaceæ*. The first chapter is devoted to introductory observations. The second describes in a popular manner "what constitutes a fern." The third contains an account of the different parts of a fern, and a definition of the principal terms used in describing species. The fourth explains how ferns are classified. The fifth and sixth chapters give directions for collecting, pressing, and cultivating ferns. The seventh chapter, which constitutes the great bulk of the book, contains an account in detail of each of the New Zealand species, with notes on its variations, localities, and behaviour under cultivation. Of the twenty-nine plates, the first contains an analysis of the structure of the New Zealand genera, and the others process-pictures of each of the New Zealand species, several to a plate.

In going through the book, the following are the critical notes I have made on point of detail:—*Pteris lomarioides* Colenso, described p. 91, figured tab. 25, fig. 4, is evidently conspecific with the cosmopolitan *P. cretica*. The *Cheilanthes* described as a new species, but not named, on p. 88, figured tab. 28, fig. 4, is, I think, a form of *C. Sieberi* Kunze, which runs into *C. tenuifolia* Sw.; and *Pteris alpina* Field, p. 97, tab. 28, fig. 2, is probably an extreme form of the same species. We have at Kew specimens exactly like Mr. Field's figure, gathered in Arnheim's Land, Australia, by Prof. R. Tate. *Lomaria paucijuga* Colenso, described by Mr. Field on p. 100, figured tab. 29, fig. 6, is evidently a mere form of a *L. vulcanica*. *L. parvifolia* Colenso, figured tab. 25, fig. 5, exactly matches *L. pumila* Raoul, which is a shade variety of *L. australis*. *L. aggregata* Colenso, described p. 103, figured tab. 29, fig. 7, is evidently a mere form of *L. lanceolata*. *Aspidium oculatum* Hook., figured tab. 29, fig. 2, is a mere form of *A. Richardi*. I cannot distinguish *Trichomanes venustulum* Colenso (p. 71, tab. 15, fig. 1) as a species, from *T. venosum* R. Br.

J. G. B.

NEW BOOKS.

E. B. Aveling.—'An Introduction to the Study of Botany.' 8vo, pp. iv. 363, 271 cuts. London, Sonnenschein. 4s. 6d.

André, E.—'Bromeliaceæ Andreanæ; Description et Histoire des Bromeliacées récoltes dans la Colombie, l'Ecuador, et le Venezuela.' 4to, pp. xi. 118, tt. 40. Paris, Masson. 25 fr.

L. Beissner.—'Handbuch der Nadelholzkunde.' 8vo, pp. xx. 576, 138 cuts. Berlin, Parey.

J. Eisenberg.—'Bakteriologische Diagnostik.' Hamburg, Voss. 8vo, pp. xxxi. 509.

Th. M. Fries.—'Lärdbok i systematik Botanik.' i. 'De Fanerogama växterna. 8vo, pp. vi. 228, 235 cuts. Stockholm, Beijers. 6 Kr.

F. Gay.—'Recherches sur le développement et la classification de quelques Algues vertes.' 8vo, pp. 117, tt. 15. Paris, Klincksieck. 12 fr.

A. Hausen.—'Pflanzen-Physiologie. Die Lebenserscheinungen und Lebensbedingungen der Pflanzen.' 8vo, pp. viii. 384, 157 cuts. Stuttgart, Wissert.

A. Johnstone.—'Botany: a concise Manual for Students of Medicine and Science.' Edinburgh & London, Pentland. 8vo, pp. xiv. 260, 164 cuts. 6s.

M. Kolb.—'Die europäischen und überseeischen Alpenpflanzen.' 8vo, pp. 373. Stuttgart, Ulmer. 8 m.

W. Migula.—'Die Bakterien.' 8vo, pp. xii. 216, 30 cuts. Leipzig, Weber. 3 m.

L. Piccioli.—'Le piante legnose italiane.' Fasc. i. Florence, Landi. 8vo, pp. vii, 129, 1 plate, 15 cuts.

P. A. Saccardo. — 'Chromotaxia, seu Nomenclator Colorum.' Padua. 8vo, pp. 22, 2 plates. 2 fr.

E. Strasburger.—'Ueber den Bau und die Verrichtungen der Leitungsbahnen in den Pflanzen.' 8vo, pp. xxxii. 1000, 5 plates, 17 cuts. Jena, Fischer.

F. Thonner.—'Anleitung zum Bestimmen der Familien der Phanerogamen.' 8vo, pp. viii. 280. Berlin, Friedlander.

W. Tuckwell.—'Tongues in Trees.' 8vo, pp. 151. London, G. Allen. 5s.

F. Wolle.—'Diatomaceæ of North America.' 8vo, pp. xiii. 47, 112 plates, 2,300 figures. Bethlehem, Pa.: Comenius Press.

ARTICLES IN JOURNALS.

Ann. Sciences Nat. (April). — E. Belzung, 'Sur l'origine des graines d'amidon et des graines chlorophylliens.' — P. Van Tieghem, 'Sur la structure et les affinités des Mémécylées.'

Bot. Centralblatt. (Nos. 12–17).—P. Schumann, 'Zur Kenntniss der Grenzen der Variation im anatomischen Bau derselben Pflanzenart' (2 plates). — (No. 12). T. Hedlund, *Ranunculus paucistamineus.* — (No. 13). E. Nickel, 'Zur Physiologie des Gerbstoffes und der Trioxybenzole.'— —. Solereder, 'Ueber eine neue Oleacee der Sammlung von Sieber' (*Linociera verrucosa* Sol. (*Vangueria verrucosa* Sieb.), *L. Mannii* Sieb., sp. n.).—(Nos. 14–17). —. Schimper, 'Uebersicht der bisherigen Ergebnisse der während der Jahre 1880 bis 1890 in den Tropen ausgeführten botanischen Forschungen.' — F. Schindler, 'Ueber die Stammpflanze der Runkel- und Zuckerrüben.'

Botanical Gazette (March). — G. F. Atkinson, 'Black Rust of Cotton.'—C. Robertson, 'Flowers and Insects.'—J. E. Humphrey, 'Notes on Technique.' — H. Bowers, 'Life-history of *Hydrastis canadensis*' (1 plate). — B. L. Robinson, *Apodanthes Pringlei*, *A. globosa*, spp. nn. (1 plate).—V. Wittrock, *Erythræa Pringleana*, sp. n.

Botanical Magazine (Tokio: Articles in English). — (Jan.). R. Yatabe, *Goodyera Nachijonesis*, sp. n. (1 plate).—Id., '*Chrysanthemum sinense* var. nov. *Satsumensis*' (1 plate). — (Feb.). Id., *Polypodium Okuboi*, sp. n. (1 plate).—(March). Id., *Sium ovatum*, sp. n. (1 plate).

Bot. Zeitung (Mar. 27–Ap. 3).—F. Rosen, 'Ueber die Bedeutung der Heterogamie für die Bildung und Erhaltung der Arten.'—(Ap. 10, 17).—C. Wehmer, 'Entstehung und physiologische Bedeutung der Oxalsäure im Stoffwechsel einiger Pilze.'

Bull. Torrey Bot. Club (March). — D. H. Campbell, 'Apical Growth of Prothallium of Ferns' (1 plate).—B. D. Halsted & D. G. Fairchild, 'Influence of Moisture upon dehiscent Fruits' (1 plate).

Gardeners' Chronicle (Ap. 11).— *Cynoches Rossianum* Rolfe, sp. n. — (Ap. 18). *Masdevallia Rolfeana* Kranzlin, sp. n. — (Ap. 25). *Scilla Adlami* Baker, sp. n.

Journal de Botanique (Mar. 16–Ap. 1).—E. Belzung, 'Développement des graines d'aleurone chez quelques Papilionacées.' — E. Bureau & A. Franchet, 'Plantes nouvelles du Thibet et de la Chine occidentale' (new species of *Rhododendron*, *Primula*, *Androsace*, *Syringa*, *Gentiana*, *Onosma*, *Schistocaryum*, *Pedicularis*).—(Mar. 16). P. Hariot, *Uromyces Poiraulti*, sp. n. — (Ap. 1). P. van Tieghem, 'Sur les tinoleucites.'—H. Léveillé, 'Sur la présence du *Taraxacum officinale* aux Nilgiris.'

Midland Naturalist (April). — W. Mathews, 'County Botany of Worcester' (contd.). — W. B. Grove & J. E. Bagnall, 'Fungi of Warwickshire' (contd.).

Nature Notes (April).—G. Henslow, Environment.—J. Mitchinson, 'Distribution of Rare Plants in Britain.'

Nuovo Giornale Bot. Ital. (Ap. 6). — E. Levier & S. Sommier, 'Addenda ad floram Etruriæ.' — T. Caruel, 'L'Orto e il Museo botanico di Firenze, 1889-90.'—J. Mueller, 'Lichenes Victoryenses, a cl. C. Pictet in insula Victory, inter Singapore et Borneo, lecti.' — M. Pitzorno, 'Richerche anatomo-fisiologische sul disco stigmatico della *Vinca major*.' — P. Baccarini, 'Sul sistema secretore delle Papilionacee.'—E. Baroni, 'Sopra alcune crittogame raccolte presso Costantinopoli.' — L. Micheletti, 'Intorno ad alcune specie di *Centaurea* della sezione *Cyanus*.' — Id., '*Mentha Pulegium* forma *albiflora*.' — A. Goiran, 'Di due Asteracee dei dintorni di Verona' (*Aster salignus*, *Centaurea hybrida*). — G. Arcangeli, 'Nettarii fiorali mostruosità e processo d'impollinazione nel *Sechium edule*.' — Id., 'Sull' ossalato calcico criptocristallino.'— Id., 'Sulla classificazione degli *Helleborus* Italiani.'—P. Voglino, 'Nota micologica.'—A. Jatta, 'Su di alcuni Licheni di Sicilia.' — P. Pichi, 'Alcuni esperimenti fisiopatologici sulla Vite in relazione al parassitismo della *Peronospora*.'

Oesterr. Bot. Zeitschrift (April). — L. Celakovsky, 'Ueber die Verwandtschaft von *Typha* und *Sparganium*.' — J. Velenovsky, 'Ueber zwei verkannte Cruciferen' (*Neslia paniculata*, *Camelina rumelica*). — J. Murr, 'Die Carex-Arten der Innsbrucker Flora.'— R. v. Wettstein, 'Die Section *Laburnum* der Gattung *Cytisus*.'—E. Junger, 'Botanische Gelegenheitsbemerkungen.' — A. Zimmeter, 'Hans Steininger' (b. Ap. 27, 1856; d. 1891).

Pharmaceutical Journal (Mar. 28).— Obituary notice of Henry Groves (1835—Mar. 1. 1891). — (Ap. 4.). E. M. Holmes & J. Bainbridge, 'Natal Aloes.' — (Ap. 11). T. H. Parke & E. M. Holmes, 'The Arrow-poison of the Pigmies.'

Scottish Naturalist (April).—C. C. Babington, Plants of Braemar. — A. Bennett, Scottish Records for 1890. — W. Phillips, 'New Discomycetes from Orkney' (*Hymenoscypha Symphoricarpi*, *Lachnella orbicularis*, *L. brunneo-ciliata*, *L. Laburni*, *Cenangium Empetri*, spp. nn.).

Zoe (Feb.).—L. M. Underwood, 'Pacific Coast *Hepaticæ*.' — A. Cogniaux, '*Vaseyanthus* (gen. nov.) *Rosei*' (Cucurbitaceæ). — K. Brandegee, 'Californian *Lobeliaceæ*.' — T. J. Brandegee, *Esenbeckia flava*, sp. n.

BOOK-NOTES, NEWS, &c.

Mr. Kidston publishes, in the last part of the *Proceedings of the Royal Physical Society of Edinburgh*, some "Notes on the Palæozoic Species mentioned in Lindley & Hutton's *Fossil Flora*." Mr. Kidston confines himself "to the original work of Lindley and Hutton, and deals only with the specimens known to them, making such observations on their types and original specimens as may be thought necessary; in those cases where the types are lost," his remarks are "confined to their figures and to other specimens which appear to throw light on the subject." It would be interesting to know whether any of the missing types are at University College, London—a suggestion based on the following extract from a circular issued late last year in connection with the new botanical laboratories at that institution:—"During the current term a very valuable collection of fossils, representing the chief genera of plants occurring in the coal-measures, has come to light, and is now being added to the series of museum objects. The late Professor Lindley, who died in 1865, was a recognised authority on fossil plants, and it was suspected that somewhere among his collections there would be a series of fossil types. Search, however, failed to reveal them, and it was only during building operations, just concluded, that they were discovered by the workmen, after twenty-five years, stowed away in three large chests."

The discussion as to the discovery of seed in the Sugar-cane continues to rage in the West Indies. The St. Kitts *Lazaretto* for Feb. 23rd comments in very strong language on the *Kew Bulletin*

article to which we referred at p. 95, for which, by the way, it erroneously holds Mr. Morris responsible: and proposes to publish in pamphlet form the whole correspondence on the subject. Mr. Harrison writes to us complaining of the conduct of *Nature* in the matter:—"A notice appeared in *Nature* giving Mr. Morris all the credit of our work; although Mr. Quelch wrote to that journal correcting the statement, not the slightest notice was taken of his letter; it was not until after Mr. Jukes-Brown had written repeatedly and strongly to the editor that any notice was taken of our work, and then the portion of our report relating to the results of previous observers was suppressed." We have more than once had to call attention (see Journ. Bot. 1880, 35; 1885, 360) to the action of the Editor of *Nature* in matters of this kind, which seems to us by no means creditable.

Mr. H. N. Ridley has published a paper on 'The *Burmanniaceæ* of the Malay Peninsula,' in which two new species are described—*Burmannia gracilis* and *Thismia fumida*.

We have received the first number of the new issue of the *New Zealand Journal of Science*, from which we learn that Mr. Thomas Kirk's *Student's Handbook of the New Zealand Flora* is in the printer's hands, and that an *Introduction to Structural Botany*, for use in N. Z. schools, by Mr. G. M. Thomson, will shortly be published. Mr. Thomson contributes to this number of the *Journal of Science* a very interesting paper on "The Humble-bee in New Zealand," from which we hope to make some extracts.

The part of the *Annals of Botany*, promised early last year, dated February last, and issued late in March, contains the 'Botanical Necrology for 1889,' and a 'Record of Current Literature for July—December' of that year. As these portions of the work are to be discontinued, it is not necessary to criticise them. The misprints and other faults are as numerous as ever, and we may be allowed to protest against those which affect this Journal. We never described *Ranunculus acris* as "A Perthshire Orchid"; Mr. Briggs did not write on most of the subjects attributed to him; nor did we speak of "*Potamogeton Tizii*"; while "*Plantago maritima*, L. form *pumila Kjellmanx*" is likely to prove even more of a puzzle than Vidal's work on the "Phanerogamæ Euringianæ." The proprietors do well to discontinue this singularly ill-edited portion of their work.

We learn from the *Daily Gleaner*, of Kingston, Jamaica, that the initiation of the Jamaica Exhibition of this year is due to our former colleague, Mr. William Fawcett, who "will ever be remembered in Jamaica history as the originator of her great International Exhibition." Mr. Fawcett has also compiled in connection with the Exhibition a handy Index to the Economic Products of the Vegetable Kingdom in Jamaica, which should be very useful to those for whom it is intended.

We are glad to learn from Dr. Trimen's *Report for 1890 of the Ceylon Botanic Gardens* that he has made "solid progress" in "the production of a book which shall not only give a systematic and

complete account of all the plants of the Island, but also enable residents and others who possess the necessary knowledge of the structure of flowers and of botanical terminology to ascertain the name of any plant met with."

The following announcement of certain changes to be introduced in connection with *Notarisia* is sufficiently interesting for reproduction :—"With the new year 1891 the Notarisia is grown larger trasforming itself in a new monthly journal which *to the general sea-weeds study* joins that of the sea and its organisms. Nevertheless for those who would not subscribe themselves to the whole review, the Algas part will still be given out in separated numbers under the title: 'La Notarisia' commentario ficologico generale parte speciale della Rivista Neptunia. The enumeration of the pages is to be continued progressively as before. 'The Notarisia' will come out every other month ; the shape remains just the same, our faithful work-fellows remain and are even encreased by precious adhesions. Nothing has been changed but for the form, and this also very little. The old Notarisia continues strengthened by a new animator life. Last April as we undertook alone the direction of the Notarisia, we wrote : *We don 't make a program, to develope improving is our devise.* Only a few months are over, and something has been done, we submit ourselves hopeful to the judgement of the readers who know us since many year and kann judge if we have improoved."

The last part (April) of the *Icones Plantarum* is largely occupied with Dr. Henry's Chinese novelties. Dr. Focke describes some new Chinese *Rubi*, two of which are figured; and Prof. Oliver (by whom most of the part is written) contributes a new *Manglietia* from Hong Kong, of which only one tree is known to exist, by which the genus is added to the Chinese Flora, and a new genus of Hæmodoraceæ (*Cyanastrum*) from West Tropical Africa. Many of the Chinese plants figured are of economic importance.

We clip the following from the *Daily News* of April 23rd :—"Down at Llanfairfechan, in Carnarvonshire, there is a lady farmer, who, instead of hoeing down the common groundsel in her fields as a noxious weed, is accustomed to encourage its growth, and systematically cultivate it as a forage crop. More than that, she is convinced that our agriculturists lose much by not utilising this prolific plant. It was the fact that the delicate canary is kept in health by eating groundsel which suggested to her many years ago to have wheelbarrows full of it gathered without the roots, and given to her father's horses and cows. They ate it greedily, and were none the worse for it. The lady has even eaten it herself, and found it wholesome and something like lettuce. 'We had (she continued) a field which at one end lay rather low and damp. There, naturally, was a crop of groundsel. I cut it, and re-cut it, with a knife or sickle, at least three times in one summer, and it grew more and more bushy and succulent, and the horses and cows feasted on it.' Why (it is asked) should not this plant be cultivated and sold in towns for horses, the same as vetches?"

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New form of Euphrasia officinalis. *L*.

A NEW FORM OF *EUPHRASIA OFFICINALIS* L. FROM SCOTLAND.

By F. Townsend, M.P., F.L.S.

(Plate 305.)

A remarkable form of *Euphrasia* occurs abundantly in the wet boggy ground of the enclosed portion of the heath which lies between the Established and Free Manses at Braemar. *Euphrasia gracilis* Fries, is common on the drier portions of the heaths and moors around Braemar; and though the Manse plant, when fresh, reminds one of *E. gracilis* by its small flowers and habit of growth, the stem being erect and simple, or with one or two pairs of suberect branches, yet in other respects it differs much from Fries's plant. The flowers are white, the upper lip being only faintly tinged with lilac; they are about the size of those of *gracilis*, but the lower lip is not longer than the upper, and the three lobes of the former are about equal; the foliage is green, without the purple tinge of that of *gracilis;* the capsule is shorter, and in proportion broader than that of *gracilis*; it is deeply notched, and is narrowed below only; the calyx and capsule are usually shorter than the bracts, and the calyx-segments are broad and more like those of *E. Rostkoviana*. The herbage among which the plant grows and on the roots of which it is parasitic, consists of *Carex flava*, *C. fulva*, *C. glauca*, *C. panicea*, *C. pulicaris*, and *Juncus supinus*. The spongy masses, on the roots of the parasite, are numerous, by which it is attached to the roots of the plants on which it feeds.

I should certainly place this new form with my Section *Graciles*, but it differs so much from the type *E. gracilis* Fries, and from anything I have seen, either in the fresh state or in herbaria, that it deserves a distinctive name, and I have named it *E. paludosa*, from the character of the ground in which it is found.

I have met with *E. paludosa* in other bogs around Braemar, and I place with it the small forms which occur in the bogs on the high moors. It is more than likely that it occurs in other parts of Scotland.

The following are the distinguishing characters:—

Euphrasia paludosa *mihi*.—Stem erect, straight, 4–8 in. long, simple or with 2–4 opposite, short, suberect branches springing from about the middle of the stem, brownish purple, with short, decurved, whitish, subadpressed pubescence. Raceme interrupted below, lowest flower at about the middle of the stem. Leaves and bracts rigid, ovate-oblong or ovate, their borders furnished with short, stiff pubescence, otherwise nearly glabrous, their under surface and occasionally their upper with whitish scaly efflorescence; teeth triangular, 3–4 on either side, of lower leaves and bracts obtuse, of intermediate and upper ones acute, shortly awned, lower teeth often curved inwards; upper bracts with cuneate base. *Calyx usually shorter than the bracts; teeth spreading, broad, triangular, acute, equalling or slightly exceeding the capsule;* veins and

teeth usually dark-coloured and with short stiff pubescence. Flowers included, small, white (or upper lip faintly tinged with lilac), with dark purple veins and yellow throat and palate; throat open; *lower lip equalling the upper and slightly exceeding the somewhat curved tube;* segments of lower lip about equal, emarginate; segments of upper lip porrect, emarginate. Stigma curved over the anthers. Capsule oblong, *narrowing below*, about twice as long as broad, emarginate, ciliate above, the mucro usually not exceeding the notch.

Grows in wet boggy ground about Braemar in Scotland, among coarse herbage, consisting principally of *Carex flava*, *C. panicea*, *C. fulva*, *C. glauca*, *C. pulicaris*, &c. Flowering (a little later than *E. gracilis*) from August to about the middle of September. Whole plant slightly larger and coarser in all its parts than *E. gracilis*; calyx-segments broader and shorter; middle segment of lower lip of the corolla shorter; capsule shorter, emarginate, narrowing below only (in *E. gracilis* the capsule is hardly or rarely emarginate, is often curved and narrowed at both ends). The upper surface of the leaves and bracts often become *dark brownish green*, together with the exposed portion of the capsule. The stem leaves, bracts and capsule of *E. gracilis* are tinged with *dark purple.*

LIST OF THE BRITISH AND IRISH RUBI IN THE HERBARIUM OF THE LATE MR. JOHN BALL, F.R.S.

By Dr. W. O. Focke.

[The British and Irish Rubi of the herbarium of the late Mr. John Ball were placed in the hands of Dr. Focke, with a request that he would report upon them. He has forwarded the following notes and determinations. The specimens collected by Mr. Ball himself seem to have nearly all been gathered in the years 1837 and 1838.—J. G. Baker].

1. Rubus Chamæmorus L.—*Scotl.:* Crante, N. Scotl.; Strath Affaric, Invernessh.; Clova Mountains; Cairn Hills; Ben-y-Glo, Perthsh.; Ben Lawers, Perthsh.; near Blair Athol, Perthsh.; Mountains between Glen Tilt and Glen Shee, Perthsh.

2. R. saxatilis L.—*Engl.:* near Richmond, Yorksh.; Wyre Forest, Staff.; Underbarrow Scar, Westmorel.; Scandale, Westm.; Great End, Cumberl. *Wales:* near Llanberis. *Scotl.:* near Edinburgh; foot of Ben Lawers; Clova; Glen Struthfarrar, Invernessh.; Camden Woods, Nairnsh. *Irel.:* Crow Glen, Divis Mnt., near Belfast; Magilligan, Derry.

3. R. Idæus L. — *Engl.:* near Twycross, Leicest.; Rydal, Westm.; Helvellyn. *Wales:* Llanberis. *Scotl.:* Glen Shee, Perthsh. *Irel.:* Care Hill and Colin Glen, near Belfast; Co. Wicklow.

4. R. suberectus G. Anders.—*Engl.:* Forest of Dean; Almond Park, near Shrewsbury (*Lindley*); Rydal, Westm. *Scotl.:* Galloway.

5. R. carpinifolius Wh. — *Engl.:* near Twycross, Leicest. (*Bloxam*); *Irel.:* Howth, near Dublin.

6. R. LINDLEYANUS Lees.—*Engl.:* Shrewsbury (labelled "*R. leucostachys*" by *Lindley*, 1837; conf. *Babington* Brit. Rubi. ed. i. p. 77).

7. R. RHAMNIFOLIUS Wh. et N.—The ordinary British form. *Engl.:* Rydal, Westmorel. *Irel.:* between Belfast and Hollywood; Magilligan, Derry; above Lough Inagh, Connemara, Galway.

8. R. MUENTERI Marss. (*R. umbrosus* of Brit. auth.). *Engl.:* Rydal, Westmorel. *Irel.:* Colin Glen, near Belfast.

9. R. RUSTICANUS Merc.—(*R. discolor* of Brit. auth.). *Engl.:* Shrewsbury (labelled "*R. rhamnifolius*" by Lindley, 1837). *Irel.:* between Belfast and Hollywood; between Kingstown and Dublin; Co. Wicklow; Co. Derry; Co. Galway.

10. R. AMPLIFICATUS Lees.—*Engl.:* Twycross, Leicest. (*Bloxam*).

11. R. SPRENGELII Wh.—*Engl.:* Bardon Hill, Leicest. (*Bloxam*).

12. R. RADULA Wh.—*Engl.:* Twycross, Leicest. (*Bloxam*).

13. R. ECHINATUS Lindl. (R. *rudis* Babingt. prius). — *Engl.:* Almond Park, near Shrewsbury (labelled "*R. rudis*" by *Lindley*, 1837).

14. R. FOLIOSUS Wh. et N., var. *saltuum* Focke (the form of sandy or granitic soil).— *Engl.:* Hartshill Wood, Warwicksh. (*Bloxam*).

15 ?. R. ROSACEUS Wh. et N.—*Irel.:* Cave Hill, near Belfast. A poor dwarf specimen, only a few inches high. The determination, therefore, is somewhat doubtful.

16. R. KOEHLERI Wh. et N.—*Engl.:* Wych, Gloucest.; Rydal, Westmorel. * Two specimens from Rydal seem to be intermediate between *R. Koehleri* and *R. rhamnifolius*. I suspect they may be hybrids, although they bear some perfect fruits. From many flowers are developed only a few carpels.

17. R. DIVERSIFOLIUS Lindl. — *Engl.:* near Ashby-de-la-Zouch (*Bloxam*).

18. R. BALFOURIANUS Blox. — *Engl.:* Between Atcham and Reston Boats, near Shrewsbury (labelled *R.* "*affinis*? or *plicatus*?" by *Leighton*, 1837).

19. R. CORYLIFOLIUS Sm. — *Engl.:* near Marsden, Durham; Cheshire; Westmoreland. *Irel.:* Co. Derry.

20. R. CÆSIUS L.—*Engl.:* Richmond, near London; near Cambridge; Shrewsbury; near Kendal, Westm. *Irel.:* Co. Wicklow; banks of L. Erne; banks of L. Carra, Mayo.

R. CÆSIUS × IDÆUS.—*Engl.:* Underbarrow Scar, near Kendal, Westmoreland.

I have omitted in this enumeration some doubtful forms represented only by small bits, which cannot be exactly determinated. Two or three imperfect Irish specimens, however, look very curious, and seem to be different from all known English forms.

---

* This I believe to be identical with the plant described by Smith as *Rubus grandulosus*, of which there is a full account on page 208 of Babington's *Synopsis*. It was originally collected at Rydal by Turner, and I have gathered it myself in the same neighbourhood.—J. G. B.

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ*.

By Edmund G. Baker, F.L.S.

(Continued from p. 53.)

IX. NAPÆA Linn. Gen. n. 838.—Bracteolæ 0. Flores dioici. Styli rami longitudinaliter stigmatosi.

Napæa dioica L.; A. Gray, Pl. Fendl. p. 20. *N. scabra* L.; Lamk. Encyc. t. 579, f. 2. *Sida dioica* Cav.; DC. Prod. i. p. 466.

Hab. Virginia!

X. MALVASTRUM A. Gray, Pl. Fendl. p. 21.—Bracteolæ 1–3 distinctæ v. 0. Styli rami apice capitellato- v. clavato-stigmatosi. Carpella seminibus conformia apice producto vacuo nullo.

Capensia. — Fruticosa vel suffruticosa. Flores purpurei, rosei vel albi.

* *Fruticosa.*

+ Folia glabra, glanduloso-pubescentia, strigosa vel parce stellato-pubescentia.

1. Malvastrum capense Garcke in Bonplandia, 1857, p. 292; Gray and Harv. in Fl. Capensis, i. p. 160. *M. capense* v. *glabrescens* Harv. in Fl. Capensis, i. p. 160. *Malva capensis* Cav.; DC. Prod. i. p. 434; Bot. Reg. t. 295. *M. grossularifolia & inodora* Bot. Reg. t. 561.

Hab. Cape Colony! Kaffraria! Natal!

Var. fragrans = *Malvastrum fragrans* Gray and Harv. in Fl. Capensis, i. p. 160. *Malva fragrans* Jacq. Hort. Vindob. iii. t. 33. *M. odorata* Maund. Botanst, v. t. 218.

Var. balsamicum Harv. in Fl. Capensis, i. p. 160. *Malva balsamica* Jacq. Ic. rar. i. t. 140; DC. Prod. i. p. 434. *M. fragrans* Bot. Reg. t. 296.

2. **M. trilobatum,** n. sp. — Caule erecto lignoso præcipue superne strigoso-pubescente, foliis trilobatis lobo medio majore serratis basi cuneatis parce pubescentibus, floribus axillaribus, pedunculis inferioribus foliosis 1–3 floribus, bracteolis oblongis acutis ciliatis calyce brevioribus, sepalis ovatis acuminatis, petalis (in sicco roseis), columna staminea hirsuta, carpellis (junioribus) dorso elevatim rugosis superne hirsutis.

Hab. Cape Colony. George District. *R. C. Alexander*, Hb. Mus. Brit.!

Stem 2–3 ft. long; leaves 1–1½ in. long; bracts ⅓ in. long; sepals ½ in. long; petals ½ in. long.

3. M. virgatum Gray and Harv. in Fl. Capensis, i. p. 162. *Malva virgata* Cav.; DC. Prod. i. p. 434.

Hab. Cape Colony!

Var. Dilleniana Harv. *l. c.* *Malva Dilleniana* E. & Z.

Var. angustifolia Harv. *l. c.*

Var. oblongifolia Harv. *l. c.*

4. M. TRIDACTYLITES Garcke in Bonplandia, 1857, p. 292; Gray and Harv. in Fl. Capensis, i. p. 162. *Malva tridactylites* DC. Prod. i. p. 434. *M. oxycanthoides* Horn.; DC. Prod. i. p. 434.

Hab. Cape Colony!

Var. GLABRA Harv. *l. c.* *Malva stricta* E. & Z. *M. reflexa* Andr. Rep. t. 135.

Var. PUBERULA Harv. *l. c.*

Var. STELLULATA Harv. *l. c.*

"Readily known from other Cape species by its deeply-cut and wedge-shaped leaves." *Harvey.*

\+ + Folia breve stellato-pubescentia.

5. M. CALYCINUM Garcke in Bonplandia, 1857, p. 292; Gray and Harv. in Fl. Capensis, i. p. 160. *Malva calycina* Thunb. Fl. Capensis, p. 550; DC. Prod. i. p. 434; Bot. Reg. t. 297. *M. amœna* Sol. in Bot. Mag. t. 1998. *M. retusa* E. & Z.

Hab. Cape Colony!

\+ ± Folia aspera tomentosa.

6. M. STRICTUM Gray and Harv. Fl. Capensis, i. p. 161. *Malva stricta* Jacq. Hort. Schoenb. iii. t. 294.

Hab. Cape Colony. Uitenhage!

7. M. ASPERRIMUM Garcke in Bonplandia, 1857, p. 292; Gray and Harv. in Fl. Capensis, i. p. 161. *Malva asperrima* Jacq. Hort. Schoenb. ii. t. 139; DC. Prod. i. p. 434.

Hab. Cape Colony!

Var. STELLATUM Harv. *l. c.* *Malva stellata* Thunb. fide E. & Z. *M. bryoniæfolia* Drège non DC.

± ± Folia molliter tomentosa.

8. **M. Burchellii**, n. sp.—Caule erecto lignoso ramoso molliter pubescente, foliis petiolatis magnis cordatis obsolete lobatis serratis molliter pubescentibus, floribus in axilis superioribus impositis, pedunculis 1-floris petiolo longioribus, bracteolis ovatis acutis calyce brevioribus, sepalis bracteolisque molliter pubescentibus, petalis roseis, carpellis nigricantibus glabris precipue ad facies elevatim rugosis.

Hab. Cape Colony, near the mouth of the Knysna River. *Burchell*, No. 5386! in Herb. Kew.

Stem 2–3 ft. long; leaves 1½–2½ in. long; bracts ¼ in. long; sepals ⅜ in. long; petals ½ in. long.

This plant has affinities with *M. capense* and *M. calycinum*, but differs from both by the soft tomentum and the shape of the leaves.

9. M. GROSSULARIÆFOLIUM Gray and Harv. in Fl. Capensis, i. p. 161. ? *Malva grossulariæfolia* Cav.; DC. Prod. i. p. 434. *M. amœna* Drège non Sims. *M. deflexa* Turcz. Bull. Soc. Mosc. 1858, p. 186.

Hab. Cape Colony!

Var. PARVIFOLIUM Harv. *l. c.* *Malva bryonifolia* Drege.

± ± + Folia dense lanato-tomentosa.

10. M. BRYONIFOLIUM Gray and Harv. in Fl. Capensis, i. p. 161. *Malva bryonifolia* L. ? fide E. & Z.

Hab. Cape Colony. Namaqualand !

* * *Suffruticosa.*

11. M. SETOSUM Harv. in Fl. Capensis, i. p. 163.

Hab. Cape Colony !

12. M. ALBENS Harv. in Fl. Capensis, i. p. 163. *Malva albens* E. Mey. *M. grossulariæfolia* E. Mey. *M. virgata* E. & Z.

Hab. Cape Colony !

The staminal column of this plant is quite glabrous.

13. M. RETUSUM. *Malva retusa* Cav.; DC. Prod. i. p. 434; Harv. in Fl. Capensis, i. p. 164.

Hab. Cape Colony !

14. M. DIVARICATUM Garcke in Bonplandia, 1857, p. 292; Gray and Harv. in Fl. Capensis, i. p. 163. *Malva divaricata* Andr. Rep. t. 182; DC. Prod. i. p. 434. *M. oxycanthoides* E. & Z. *M. microphylla* E. Mey.

Hab. Cape Colony !

15. **M. Pappei,** n. sp.—Caule tenue ramoso parce glanduloso-pubescente, foliis profunde trilobatis vel trisectis segmentis pinnatilobatis vel pinnatisectis glanduloso-pubescentibus, pedunculis axillaribus unifloris solitariis petiolo subæquantibus, stipulis lanceolatis acutis, bracteolis anguste-ovatis acutis calyce brevioribus, sepalis lanceolatis acutis vel subacuminatis, petalis (in sicco roseis), columna staminea hirsuta, carpellis nigricantibus lævibus glabris dorso rotundatis.

Hab. Cape of Good Hope, *Pappe* in Herb. Kew !

Stem 1–2 ft. high; leaves $\frac{1}{2}$–$\frac{3}{4}$ in. long; bracts $\frac{1}{5}$ in. long; sepals $\frac{3}{8}$ in. long; petals $\frac{1}{3}$ in. long.

This plant resembles *M. dissectum* in its multifid leaves.

16. **M. Alexandri,** n. sp. — Caule tenue prostrato parce stellato-tomentoso, foliis parvis trilobatis vel trisectis lobo vel segmento medio interdum trilobatis segmentis incisis vel crenati, superne fere glabris inferne stellato-tomentosis, pedunculis brevis bus 1–3 floris, bracteolis oblongo-spathulatis calyce brevioribus-sepalis dense stellato-tomentosis triangularibus acutis, petalis (in sicco roseis), columna staminea glabra, carpellis (junioribus) pubescentibus.

Hab. Cape Colony. George District. *R. C. Alexander*, Hb. Mus. Brit. !

Stem 1 ft. long, possibly more; leaves $\frac{1}{2}$ in. long; bracts $\frac{1}{4}$ in. long; sepals $\frac{3}{10}$ in. long; petals $\frac{1}{3}$ in. long.

17. M. RACEMOSUM Harv. in Fl. Capensis, i. p. 163. *Malva racemosa* E. Mey.

Hab. Cape Colony !

18. M. PROCUMBENS Harv. in Fl. Capensis, i. 164.

Hab. Cape Colony. Gamke River !

19. M. DISSECTUM Harv. in Fl. Capensis, i. p. 164. *Malva asperrima* E. & Z.

Hab. Cape Colony. Kochman's Kloof, Swellendam.

"The leaves of this plant resemble those of a *Grielum*."

AMERICANA (2 nunc cosmopolitana). — Herbæ caulescentes vel acaules. Flores purpurei, rosei, coccinei, flavi vel albi.

§ *Flores axillares pedunculo cum petiolo non connato.*

† Caulescentia.

* Pedunculi tandem longi et tenues uniflori. Petala rosea vel alba.

Annua.

20. M. ROTUNDIFOLIUM A. Gray in Proc. Am. Acad. vii. p. 333.

Hab. United States. Arizona! California.

21. M. EXILE A. Gray, Bot. Ives. Colorado, Exp. p. 8.

Hab. United States. Arizona! California! Mexico!

22. M. PARRYI Greene, Fl. Franciscana, p. 108.

Hab. United States. California.

** Pedunculi breves vel nulli. Flores aggregati.

Petala cærulea vel rosea. Annua.

23. M. MULTICAULE Britton in Bull. Torrey Club, xvi. p. 153. *Malva multicaulis* Schlecht. in Lechler Pl. Peru, No. 1784.

Hab. Peru, Bolivia!

24. **M. antofagastanum.** *Malva antofagastana* Phil. in Herb. Kew.—Annuum, multicaule, foliis profunde 3–5 lobatis, segmentis irregulariter incisis vel serratis, floribus sessilibus aggregatis, bracteolis calyce brevioribus, sepalis ovatis acutis hirsutis, petalis (in sicco cæruleis) calyce subæquantibus, carpellis dorso hirsutis.

Hab. Chili. Antofagasta de la Sierra, *Philippi*!

Stem 6 in.; leaves 1 in. long.

25. **M. tarapacanum.** *Malva tarapacana* Phil. in Herb. Kew. —Annuum, caule ramoso, foliis trilobatis lobo medio, majore segmentis crenatis molliter pubescentibus, floribus parvis glomeratis axillaribus pedunculatis, bracteolis linearibus, sepalis triangularibus acutis, petalis (in sicco cæruleis) calyce subæquantibus, carpellis dorso stellato-pubescentibus breviter bicuspidatis.

Hab. Chili. Tarapaca, *Philippi*!

Stem 8 in. to 1 ft.; leaves 1 in. long.

26. M. JACENS S. Wats. in Proc. Am. Acad. xxi. p. 417.

Hab. Mexico!

*** Pedunculi nulli. Flores solitarii, petala albo-plumbea.

Annuum.

27. M. PYGMÆUM. *Sida pygmæa* Remy in Ann. Sc. Nat. 3rd Ser. viii. p. 238. *Malva pygmæa* Wedd. Chlor. And. ii. p. 274.

Hab. Bolivia. Laguna de Potosi, *D'Orbigny*.

⁂ Pedunculi longi multiflori, secundi. Petala purpurea, rosea vel cærulea. Annua.

+ Carpella muricata vel lævia.

28. M. PERUVIANUM A. Gray, Bot. United States Explor. Exp. p. 146. *Malva peruviana*, L.; Jacq. Hort. Vindob. t. 156; DC. Prod. i. p. 435; Wedd. Chlor. And. ii. p. 274. *M. limensis* Hook. et Arn. Bot. Misc. iii. p. 151. *M. Matthewsii* Turcz. in Bull. Soc. Mosc. xxxvi. p. 563.

Hab. Mexico! Peru! Chili! New Granada! Bolivia!

Var. LIMENSE = *Malva limensis* L.; Jacq. Hort. Vindob. t. 141; DC. Prod. 1. p. 435.

Hab. Peru!

Var. SCORPIOIDES = *Malva scorpioides* Turcz. in Bull. Soc. Mosc. xxxvi. p. 562.

Hab. Peru. Lima. *Mathews*, No. 1006!

Malva echinata Presl, *M. costata* Presl, and *M. Haenkeana* Presl, I do not know; they must, however be closely allied to the above.

+ + Carpella longe biaristata.

29. M. PLUMOSUM A. Gray, Bot. United States Explor. Exp. p. 147. *Malva plumosa* Presl, Rel. Haenk. ii. p. 124. *Malva operculata* Cav.; DC. Prod. i. 435.

Hab. Peru!

Var. ATACAMENSE. — Tota herba flava, foliis angustioribus quam typo.

Hab. Chili. Desert of Atacama. *R. Pearce*!

30. **M. bolivianum**, n. sp. — Annuum, caule flexuoso foliis viridibus petiolatis pinnatipartitis segmentis supremis irregulariter incisis vel serratis segmentis infimis irregulariter pinnatipartitis sparse stellato-hirsutis, pedunculis multifloris secundis, sepalis ovato-vel lanceolato-acutis, petalis cæruleis calyce duplo longioribus, carpellis biaristatis, aristis loculo duplo longioribus plumosis.

Hab. Bolivia. Tarija. *R. Pearce*, March, 1864, Herb. Kew!

Stem 1–2 ft. high; leaves 1½–2 in. long sepals ¼ in.; petals nearly ½ in.

⁂ Pedunculi multiflori corymbosi. Petala purpurea vel cærulea. Perennia.

31. M. CAPITATUM. *Malva capitata* Cav.; DC. Prod. i. p. 434; Wedd. Chlor. And. ii. p. 274.

Hab. Peru! Bolivia!

32. M. RUSBYI Britton in Bull. Torrey Club, xvi. p. 64.

Hab. Bolivia. La Paz!

⁂ Pedunculi axillares multiflori. Petala alba. Perennia.

33. M. VITIFOLIUM Hemsl. Biolog. Centr. Amer. i. p. 100. *Malva lactea* Ait. Hort. Kew, ii. p. 448. *Malva vitifolia* Cav.; DC. Prod. i. p. 434.

Hab. Mexico!

34. M. RIBIFOLIUM Hemsl. Biolog. Centr. Amer. i. p. 100. *Malva ribifolia* Schlecht. in Linnæa, xi. p. 351.
Hab. South Mexico!

35. M. SCHAFFNERI S. Wats. in Proc. Am. Acad. XXV. p. 143.
Hab. North Mexico! *Schaffner*, No. 160.

36. M. MEXICANUM Hemsl. Biolog. Centr. Amer. i. p. 99. *Malva mexicana* S. Schauer. in Linnæa, xx. p. 724.
Hab. Mexico. Zimapan, *Aschenb.* No. 614.

* * * Pedunculi uniflori petiolo longiores.
Petala cærulea vel rosea. Annua vel perennia.

37. M. BELLOA A. Gray, Bot. United States Explor. Exp. p. 150 in adnot. *Malva Belloa* C. Gay, Fl. Chili, i. p. 304, t. 7.
Hab. Chili!

38. M. CAMPANULATUM Nicholson, Dict. of Gard. ii. p. 319. *Malva purpurata* Lindl. Bot. Reg. t. 1362; Bot. Mag. t. 3814. *M. campanulata* Paxt. Mag. Bot. ix. p. 173. ? *Sida decipiens* St. Hil. et Naud in Ann. Sc. Nat. 2nd Ser. xviii. p. 54.
Hab. Chili! Uruguay!

39. M. TENUIFOLIUM. *Malva tenuifolia* Hook. & Arn. Bot. Misc. iii. p. 150. *M. læta* Phil. in Herb. Kew.
Hab. Chili!

* * * * Pedunculi solitarii longi uniflori.
Petala rosea. Perennia.

40. M. LATERITIUM Nicholson, Dict. of Gard. ii. p. 319. *Malva lateritia* Bot. Mag. t. 3846. *M. lasiocarpa* St. Hil. et Naud. in Ann. Sc. Nat. 2nd Ser. xviii. p. 45.
Hab. Uruguay! Buenos Ayres!

41. **M. Tweedii**, n. sp.—Caule tenue hirsuto, foliis viridibus 3–5-palmatilobatis basi cordatis segmentis irregulariter incisis vel serratis, pedunculis axillaribus tenuibus unifloris petiolo longioribus, bracteolis ovatis acutis calyce brevioribus, sepalis lanceolatis acutis corolla brevioribus, petalis (in sicco) roseis, carpellis dorso rotundatis minute pubescentibus.
Hab. Uruguay. *Tweedie*!
Leaves $\frac{3}{4}$–1 in. long; bracts $\frac{1}{6}$ in.; sepals $\frac{1}{4}$ in.; petals $\frac{1}{3}$ in.

* * * * * Pedunculi vel pedicelli breves vel nulli. Petala flava.
↔ Annuum.

42. M. ANGUSTUM A. Gray, Pl. Fendl. p. 22. *Sida hispida* Pursh; Hook. Bot. Journ. i. p. 198.
Hab. United States. Tennessee! Illinois!

↔ ↔ Perennia vel in regioni boreali annua.

43. M. RUGELII S. Wats. in Proc. Am. Acad. xvii. p. 367. *Malva scoparia* Jacq. Ic. Pl. Rar. t. 139, non L'Herit. *M. corchorifolia* Desrouss. in Lam. Dict. iii. p. 755.
Hab. United States. West Indies.

44. M. TRICUSPIDATUM A. Gray, Pl. Wright, i. p. 16. *Malva tricuspidata* Ait.; DC. Prod. i. p. 430. *M. Coromandeliana* L. *M. subhastata* Cav.; DC. Prod. i. p. 430. *M. americana* Cav.; DC. Prod. i. p. 430. *M. Domingensis* Spr. in DC. Prod. i. p. 431. *M. Lindheimeriana* Scheele in Linnæa, xxi. p. 470. *M. curassavica* Desr. in Lamk. Encyc. iii. p. 754. *Malvastrum carpinifolium* A. Gray in Pl. Fendl. p. 22, excl syn. *Sida carpinifolia* and *planicaulis*. *M. coromandelianum* Garcke in Schweinf. Fl. Æthiop. p. 267. *Sida carpinoides* DC. Prod. i. p. 461.

Hab. Tropics of both hemispheres.

45. M. SCABRUM A. Gray, Bot. United States Explor. Exp. p. 147. *Malva scabra* Cav.! DC. Prod. i. p. 430. *Malvastrum tricuspidatum* var. *bicuspidatum* S. Wats. in Proc. Am. Acad. xxi. p. 417.

Hab. Mexico!

45. M. SCOPARIUM A. Gray, Bot. United States Explor. Exp. p. 147. *Malva scoparia* L'Herit. Stirp. t. 27; DC. Prod. i. p. 430. *Sida depressa* Benth. Bot. Voy. Sulph. p. 69.

Hab. Southern United States. Mexico. Peru! Venezuela!

47. M. SPICATUM A. Gray, Pl. Fendl. p. 22. *Malva spicata* L.; Cav.; DC. Prod. i. p. 430. *M. americana* L.; DC. Prod. i. p. 430. *M. ovata* Cav.; DC. Prod. i. p. 430. *M. polystachya* Cav.; DC. Prod. i. p. 430. *M. Timorensis* DC. Prod. i. p. 430. *M. brachystachya* Fr. Muell. in Linnæa, xxv. p. 378. *M. fluminensis* Vell.

Hab. Tropics of both hemispheres.

48. M. WRIGHTII A. Gray, Pl. Fendl. p. 21. *Malva aurantiaca* Scheele in Linnæa, xxi. p. 469. *Malvastrum aurantiacum* Walp. Ann. ii. p. 153.

Hab. United States. Texas!

* * * * * * * * * * Pedunculi vel pedicelli breves. Petala coccinea vel rosea.

Perennia.

49. M. LEPTOPHYLLUM A. Gray, Pl. Wright, i. p. 17.

Hab. United States. S. W. Texas to S. Utah. North Mexico.

50. M. PALMERI S. Wats. in Proc. Am. Acad. xii. p. 250.

Hab. United States. California!

51. M. DENSIFLORUM S. Wats. in Proc. Am. Acad. xviii. p. 368.

Hab. United States. S. California!

52. M. MARRUBIOIDES Durand and Hilgard in Journ. Acad. Phil. ser. 2, iii. p. 38. *M. foliosum* S. Wats. in Proc. Am. Acad. xx. p. 356.

Hab. United States. California.

53. M. ORBICULATUM Greene, Fl. Franciscana, p. 109.

Hab. United States. California.

54. M. FREMONTI Torr. in Pl. Fendl. p. 21.

Hab. United States. California!

55. M. THURBERI A. Gray, Pl. Thunb. p. 307. *Malva fasciculata* Nutt. in Torr. and Gray. *Malvastrum fasciculatum* Greene, Fl. Franciscana, p. 108.

Hab. United States. California! Arizona. S. Utah. North Mexico!

Var. LAXIFLORUM A. Gray, Proc. Am. Acad. xxii. p. 291. *M. splendidum* Kellogg in Proc. Am. Acad. i. p. 65.

Hab. United States.

56. M. COCCINEUM A. Gray, Pl. Fendl. p. 21 and 24, partly. *Cristaria coccinea* Pursh.; Sims in Bot. Mag. t. 1673. *Malva coccinea* Nutt. Fras. Cat. *Sida coccinea* DC. Prod. i. p. 465.

Hab. United States! Canada! North Mexico!

Var. DISSECTUM = *Sida dissecta* Nutt.; Torr. and Gray, Fl. i. p. 235.

Hab. United States!

Var. ELATUM. — Statura majora quam typo segmentis foliorum latioribus.

Hab. United States. *Wright*, No. 41. *Fremont*, No. 411!

†† Acaulia.

+ *Flores involucellati.*

++ Folia superne glabra.

57. M. ACAULE A. Gray, Bot. United States Explor. Exp. p. 150. *Malva acaulis* Cav.; DC. Prod. i. p. 435; Wedd. Chlor. And. ii. p. 274.

Hab. Peru! Bolivia! New Granada. Venezuela.

β. GRANATENSIS Wedd. Chlor. And. ii. p. 275.

Hab. New Granada. *Linden*!

58. M. PURDIÆI A. Gray, Bot. United States Explor. Exp. p. 150. *Malva Purdiaei* Wedd. Chlor. And. ii. p. 275.

Hab. New Granada!

β. HUANTENSE.—Foliis longius petiolatis quam typo cordato-ovatis crenatis.

Hab. Andes of Huanta. *R. Pearce*!

59. M. PARNASSIFOLIUM A. Gray, Bot. United States Explor. Exp. p. 150. *Sida parnassifolia* Hook. Ic. Pl. t. 385. *Malva parnassifolia* Wedd. Chlor. And. ii. p. 275.

Hab. Ecuador! Bolivia!

β. LOBULATA Wedd. Chlor. And. ii. p. 275.

Hab. Bolivia, prov. Ornasuyos, *Mandon*!

60. M. RHIZANTHUM A. Gray, Bot. United States Explor. Exp. p. 148. *Malva rhizantha* Wedd. Chlor. And. ii. p. 276.

Hab. Peru, *Mathews*!

++ ++ Folia hirsuta.

61. M. RICHII A. Gray, Bot. United States Explor. Exp. p. 149. *Malva Richii* Wedd. Chlor. And. ii. p. 276.

Hab. Peru. *Maclean, Mathews*!

62. M. HUMILE A. Gray, Bot. United States Explor. Exp. p. 150. *Malva humilis* Gill. in Hook. Bot. Misc. iii. p. 150; C. Gay, Fl. Chili, i. p. 300; Wedd. Chlor. And. ii. p. 275.

Hab. Chili!

+ + *Flores involucello destituti.*

63. M. NUBIGENA = *Malva nubigena* Wedd. Chlor. And. ii. p. 276. *Sida nubigena* Walp. in Nova Acta, xix. Suppl. i. p. 507.

Hab. Peru. Bolivia, *Mandon*.

66. M. ORIASTRUM = *Malva Oriastrum* Wedd. Chlor. And. ii. p. 277.

Hab. Bolivia, prov. Cinti, *Weddell*.

The last two plants I have not seen, and possibly they may not belong to the genus *Malvastrum*.

(To be continued.)

SEXUALITY AMONG THE *CONJUGATÆ*.

BY ALFRED W. BENNETT, B.Sc., F.L.S.

I HAVE for many years maintained, in opposition to the views of Cooke, Bessey, and some other cryptogamists, that the process of "conjugation in the *Zygnemaceæ*, the higher order of the *Conjugatæ*, is a sexual one: the filaments, where the conjugation is "scalariform," being always differentiated into male and female. Will you allow me to call the attention of those of your readers who are interested in the subject to three memoirs, all very recently published, which strongly confirm the view I have taken, and, indeed, may almost be regarded as setting the question at rest:—"Eine Notiz über das Verhalten der Chlorophyll-bänder in den Zygoten der Spirogyra-arten," in the *Botanische Zeitung* for 1890, No. 28, by Herr V. Chmielevsky; "Zur Kenntniss der Conjugation bei Spirogyra," in the *Sitzungsberichte* of the Vienna Academy of Sciences, vol. xcix., Heft. 6 & 7, by Dr. G. Haberlandt; and "Sulla conjugazione delle Zignemee," in *Neptunia* for Feb. and March, 1891, by Mr. W. West.

Herr Chmielevsky has established the remarkable fact, from observations made on several species of *Spirogyra* and *Rhynchonema*, that in the zygote no coalescence takes place between the chlorophyll-bands of the "male" and those of the "female" cell, and that those of the latter always exhibit a more regular spiral than those of the former. Even after complete conjugation, the "female" band always retains its green colour, while the "male" band turns yellow and becomes disorganised, finally becoming absorbed into the protoplasm of the cell. This is equally the case whether the conjugation be "scalariform" or "lateral"; in the latter case the "male" band always lies nearer to the conjugating canal. The germinating zygote contains a single nucleus and a varying number of chlorophyll-bands, but always the same number as those in the "female" cell, which remain unchanged in the zygote.

According to Prof. Haberlandt, the contraction of the protoplast of the "female" cell, and its conversion into a gamete, are the result of an excitation exerted on it by the male cell. The "male" and "female" filaments, indeed, appear to exert a mutual excitation on one another. The two conjugating tubes are not always formed

exactly opposite to one another, and one or the other has to bend in order that they meet; and this curvature appears to be the result of the chemical excitation of a substance exuded from the extremities of the tubes.

Mr. West adds his testimony that, in a very large number of cases examined, he never came across an instance of "cross-conjugation," *i. e.*, of some of the cells in the same filament being active, others passive, in the act of conjugation. Nor does there appear to be an example of "cross-conjugation" in any of the very numerous specimens preserved in public herbaria. He adds some interesting observations on polyandry and polygamy in the *Zygnemaceæ*.

I do not myself entertain any doubt that, even in lateral conjugation, there is an incipient differentiation of sex, though this differentiation extends only as far as the individual cells. It does not seem to me a fatal objection to this theory that we may have, even in the same species, some individuals in which the differentiation is only cellular (lateral conjugation), others in which it extends to the entire filament (scalariform conjugation). Whether, in the lower family of *Conjugatæ*, the *Desmidiaceæ*, there is also a rudimentary sexual differentiation, is a very interesting question, which yet remains to be decided.

THE SEGREGATES OF *SPERGULA ARVENSIS* L.

By G. Claridge Druce, M.A., F.L.S.

In this Journal for 1880, pp. 16–19, Mr. Nicholson published an interesting paper on the forms of *Spergula arvensis*, which first drew my attention to the subject. Since that time I have examined many hundreds of specimens, and the results of the examination quite bear out Mr. Nicholson's statements. Some of the following observations have been already made in Mr. Nicholson's paper, but I may be pardoned for again calling attention to them.

In *Ic. Pl. Crit.* Cent. vi. pp. 10, 11, Reichenbach describes the two species, *S. sativa* and *S. vulgaris*, into which Boenninghausen, in *Prodr. Fl. Monasteri.* p. 135 (1824), had divided the Linnean *Spergula arvensis*, and identifies *S. sativa* Boenn. with *S. arvensis* of the *Species Plantarum*. He says of *S. sativa*:—"Petalis subrotundis, seminibus elevato-punctatis," and quotes the E. B. 1535, which is reproduced with additions in Syme E. B. 252; but of *S. vulgaris* Boenn. he says:—"Petalis oblongis, seminum papillis clavatis erectis," and refers to *Flora Danica* t. 1033. Hartman, in *Fl. Scand.*, considers this plant to be the type of the Linnean *S. arvensis*. I have recently examined the Linnean Herbarium, and find that the only specimen labelled *S. arvensis* is quite typical *S. vulgaris* Boenn., as is the specimen in *Hort. Cliff.* The Morisonian plant is also *S. vulgaris*.

When growing in dry, sandy soil, *S. sativa* may be distinguished

from *S. vulgaris* by the more viscid pubescence with which it is clothed, and by the duller and more yellowish green colour of the former plant. *S. vulgaris* is usually of a rather glossy grass-green colour, and less hairy than *S. sativa*. Probably both species have a series of forms which vary in degrees of pubescence, and possibly of colour, yet as a general rule I think the above statement made by Mr. Nicholson will be found to be correct when describing plants from the British Isles.

Boreau (*Flore du Centre*, ii. 102) says of *S. sativa* (to which he gives specific rank as *S. arvensis* L.), "Pubescente et un peu visqueuse au sommet"; while *S. vulgaris* is "plus grêle, pubescente glanduleuse un peu visqueuse."

The difference in the relative viscosity of *S. sativa* and *S. vulgaris* was strongly impressed upon my mind in September last, when I found *S. sativa* (accompanied with *S. vulgaris*) for the first time in Berks in a sandy field on Boars Hill, near Oxford, growing with many plants of *Senecio Jacobæa*. It was a singular fact that plants of *S. sativa* might be picked out from those of *S. vulgaris*, from their being more or less covered with the pappus of the *Senecio* which in its wind-driven progress across the field became attached to *S. sativa*, but which the less viscid foliage of *S. vulgaris* did not retain.

The confusion in Syme's E. B. plates seems to show that Syme was not well acquainted with the characters of the forms of *S. arvensis* which he called varieties. Through the kindness of Mr. Hanbury, I have seen the specimens in the Boswell Herbarium, and I find he by no means invariably separates the plants to which he gave varietal rank. As I have pointed out, the E. B. 1535 is reproduced with additions in Syme's E. B. 252 (the seeds of the two plants being unfortunately transposed on the plates) as his var. *sativa*; while the E. B. 1536, which Smith in error called *S. pentandra*, but which was really *S. sativa* Boenn., is made to do duty for Syme's var. *vulgaris*. Since the original E. B. plate 1536 was also a figure of *S. sativa*, we really lack a true figure of *S. vulgaris*, although, as I have previously said, from the suppression of the pubescence, or from its being carelessly printed, the reproduced plate no. 253 does fairly well for *S. vulgaris*, if we follow Syme's direction and transpose the drawings of the seeds from the Plate 252.

Syme says the seeds of his var. *vulgaris* are clothed with "clavate deciduous papillæ." I have never found any seeds of *S. vulgaris* without them, but as the seeds mature the papillæ darken in colour, and so may more easily escape observation. I have not noticed the variety mentioned by Boenninghausen which, he says, has uniformly brown papillæ.

Smith (*Eng. Flora*, ii. 338) says that "intermediate appearances may be traced between the round rough angular seeds of the common spurrey [*vulgaris*] and the smooth lenticular bordered ones of this [*sativa*] variety." If this statement be correct, it would militate against their claim to specific distinction. But is it true? I have never seen any seeds of *S. sativa* with papillæ, nor

any seeds of *S. vulgaris* without, nor any plants with intermediate characters. I have seen plants which were labelled "*S. sativa* with seeds having a few papillæ," but the sheet so labelled in the Boswell Herbarium will be seen on examination to consist of two plants fastened down together, one *S. sativa*, the other *S. vulgaris*.

As to the distribution of the two plants, my observation bears out Mr. Nicholson's statement that *S. sativa* is *the* Scotch plant. Up to now I have not seen any Scotch specimens of *S. vulgaris*. I have collected *S. sativa* in W. Ross, E. Ross, Argyll, Westerness, Easterness, Nairn, Banff, Aberdeen N. and S., Forfar, Perth E., M. and W., Stirling, Edinburgh, Peebles, Wigton, and Kirkcudbright.

In England and Wales I have seen it in Cumberland, Westmoreland, Durham, York N.W., Oxon (very rare), Berks (rare), Anglesea, and Carnarvon; and in Ireland in Co. Dublin.

In the Boswell Herbarium *S. sativa* is represented by specimens from Lancashire, Cheshire, Salop, Orkney, Lanark, Cardigan, Surrey, Essex, Middlesex, and Antrim.

S. vulgaris is the common plant of Central England. I have collected it in Lincoln S., Warwick, Gloster E., Northants, Beds, Bucks, Oxon, Berks, Sussex E., Hants N. and S., Wilts N., Dorset, Cork, Kerry, and Dublin.

The Boswell Herbarium contains specimens from Cheshire, Lincoln, Surrey, Middlesex, Somerset, and Jersey.

In the Oxford Herbarium we have *S. sativa* from Khasia (Hook. f. et T. sub nom. *S. pentandra*); St. Petersburg (*Fl. Ingric.* 122); Portugal (*Welwitsch* 812); Sweden (*Rel. Maill.* 929). I have seen it in France, Spain, and Germany.

S. vulgaris is represented by specimens from Marocco; Russia; near Paris (*Rel. Maill.* 198); Sicily (*Todaro* 985); Greece (*Melos*). I have seen it in Belgium, Holland, France, Austria, Switzerland, Spain, and Germany.

S. maxima Weihe (see *Journ. Bot.* 1880, 17) does not merit specific rank. Both *S. sativa* and *S. vulgaris* have a large form which occurs in rich arable soil. Messrs. Sutton & Co. cultivate *S. sativa* for fodder purposes. *S. maxima* has papillate seeds, hence it comes under *S. vulgaris*.

To sum up—I would claim specific rank for these two segregates of the Linnean *S. arvensis*, basing my conclusion on the constant and definite seed characters which distinguish these two plants, not only in the field, but in herbarium specimens, and are constant in cultivation. The difference in their distribution must also be borne in mind. If they be given specific rank, we shall have to call the plant with papillæ *S. arvensis* L. Sp. Pl. ed. 1, 440, et Herb.! The plant without papillæ on the seed will be *S. sativa* Boenn., thus reversing Reichenbach's determination.

NEW PAPUAN PLANTS.

Described by Baron Von Mueller, K.C.M.G., M.D., F.R.S.

Aristotelia Gaultheria, sp. n.—Leaves rather small, on very short petioles, ovate-lanceolar, distantly and narrowly or hardly denticulated, gradually much contracted into an acute apex, rounded at the base, above reticular-venulous and (except at the margin and along the median line) soon glabrous, beneath, as well as the young branchlets, bearing a dense brownish somewhat silk-like tomentum; flowers very small; pedicels of double or triple the length of the sepals and, as well as these, beset with appressed hairlets; petals glabrous, without any denticulation; stamens twelve to fifteen; filaments pilosulous, about as long as the anthers, the latter nearly glabrous, pointless, half as broad as long; ovulary two-celled, as well as the style, glabrous.

On the summit of Mt. Yule, in very damp jungle. (Expedition of the R. G. S. of Australia, Vict. Branch).

Leaves $\frac{1}{2}$–2 in. long, of rather firm texture. Sepals four or five, hardly $\frac{1}{8}$ in. long. Petals slightly longer, cuneate-obovate, somewhat inflexed, occasionally at the summit sinuous. Fruit unknown. On hurried inspection this plant might be taken for a *Gaultheria*, such as *G. mundula*, although branchlets and leaves are opposite. While the fruit remains unknown, the generic place of this remarkable plant cannot positively be fixed, but all the floral characters are congruous with those of *Aristotelia*, unless the perhaps definite number of stamens; and no other described genus of *Tiliaceæ* could receive this plant. Indeed the flowers are rather similar to those of *A. racemosa*, but contained in a much shorter panicle or raceme.

The presence of this genus also in the New Hebrides was demonstrated by me before.

Ternstrœmia Britteniana, sp. n.—Glabrous. Leaves rather small on quite short petioles, mostly obovate-lanceolar, without any denticulation, somewhat brownish beneath, the venulation much concealed; pedicels solitary, often twice as long as the flowers, mostly lateral, somewhat recurved; bracteoles very small, deltoid, semi-lanceolar: flowers unisexual; sepals unequal, all eglandular; petals about as long as the calyx, disconnected to near the base; stamens usually 20–25; anthers linear-elliptic, blunt; filaments thin, some as long as the anthers; style stout, rather short, undivided; stigmas conspicuous, renate-semiorbicular; fruit very much longer than the calyx, hollow, nearly globular or verging into an ovate form, somewhat pointed at the summit, two-celled, seeds 9–11, maturing in each cell of well-developed fruits, considerably compressed.

In the higher regions of Mount Yule.

An often intricately-branched, and perhaps occasionally dwarfed, shrub. Branchlets robust. Leaves usually $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, generally somewhat recurved at the margin, their stalk $\frac{1}{4}$ in. long, or shorter. Pedicels $\frac{2}{3}$–1 in. long. Sepals roundish. Petals much overlapping in buds, the outermost then amply enveloping the

others. Stamens glabrous. Style about $\frac{1}{8}$ in. long. Stigmas considerably broader than the summit of the style. Fruit $\frac{3}{4}$–1 in. long, perhaps pulpless. Pericarp comparatively thin, indehiscent. Dissepiment membranous, fragile; secondary septules none. Funioles of various length. Seeds closely packed, nearly oblique-ovate, $\frac{1}{4}$–$\frac{1}{3}$ in. long; in their dry state outside dull, brownish, slightly angular; testule of bony hardness in a median line inside, elevated. Embryo bent in an oblique-elliptic curvature, but, as well as the albumen, shrivelled in all these seeds available at this occasion.

Systematically this species stands nearest to *T. Penangiana*, but the leaves are much smaller, the flowers also of lesser size, the petals hardly merging beyond the sepals, the stamens less numerous, and although the fruit is very much smaller, yet the seeds are far more copious. Indeed, in this respect our new plant stands apart from all other known congeners; B. & H., and later, also Dyer, recording the number of ovules in each ovulary-cell for *Ternstræmia* up to six, and that only as of rare occurrence. In outward appearance the Papuan plant reminds of the Brazilian *T. cuneifolia*.

In Mr. H. O. Forbes's collection (660), formed with so much difficulty near the Owen Stanley Ranges, is contained the same or a closely allied species, but here only a specimen, without fruit, and with a solitary flower, is extant, in which the stamens are thirty-five.

The remarkable new species now described is dedicated to James Britten, Esq., of the British Museum of Natural History, who, very long in that important position, and since eleven years as editor of the *Journal of Botany*, has rendered such extensive, lasting, and onerous services to botanical science.

Rhododendron Macgregoriæ, sp. n. — Branchlets almost glabrous. Leaves on short petioles, often whorled, mostly ovate-lanceolar, occasionally acuminated, on both sides glabrous, beneath subtle-dotted. Pedicels rather longer than the flowers, nearly glabrous. Calyx rudimentary, somewhat patellar, lobeless. Corolla rather small, yellowish; the tube rather narrow, nearly or fully thrice shorter than the lobes, inside beset with minute hairlets, the lobes almost glabrous. Stamens ten, slightly surpassed by the corolla; filaments from below the middle to the base bearing copious short spreading hairlets. Anthers ellipsoid, somewhat truncate; style towards the base beset with very short vestiture. Ovulary conic-hemiellipsoid, provided with a grey velvety indument.

On Mt. Yule, at about 11,000 ft. elevation.

Leaves, so far as known, to 3 in. long and to 1 in. broad, thinly venulated. Corolla hardly of 1 in. length. Anthers about $\frac{1}{12}$ in. long. Fruit not obtained.

This description is offered from scanty and very fragmentary material. The species among Papuan congeners comes nearest to *R. culminicolum*, but the leaves are usually larger, the pedicels considerably longer, and the corolla is very deeply lobed, indeed, more

so than even in *R. lepidotum*, or in any other species with which I am acquainted.

The dedication to Lady Macgregor is to mark my gratitude to her distinguished consort, for having, by his gubernatorial influence, and under his own auspices, caused Mount Yule for the first time to be ascended, the plan and subsidies for this enterprise having emanated from the Victorian branch of the Royal Geographic Society of Australia.

(To be continued.)

IS *LYCOPODIUM COMPLANATUM* A BRITISH PLANT?

By Henry and James Groves.

In 1842, Spring, in *Monographie de la famille de Lycopodiacées*, included among the localities for *L. complanatum* "Scotia," but we have no evidence as to the specimens on which the record is based. In 1866, a *Lycopodium* was collected by Mr. J. Lloyd at Bramshot, Hants, and sent to the *Gardeners' Chronicle*, where it was recorded (p. 753) as *L. complanatum*. In 1867, Mr. Lloyd sent another specimen from the same locality, expressing an opinion that it was *L. alpinum*. This specimen was referred to Prof. Babington, who was inclined to place it under *L. Chamæcyparissus*. In the *Flora of Hampshire*, p. 444, Mr. Townsend infers that Mr. Lloyd recorded his plant as *L. complanatum*, and states that "apparently Prof. Babington would refer the Bramshot plant to *L. alpinum* (Journ. Bot. 1882, 322)," whereas as a matter of fact Mr. Lloyd maintained that his plant was *L. alpinum*, and it was Babington who thought otherwise.

In 1882, Mr. G. C. Druce (Journ. Bot. p. 321, tab. 233) described and figured as *L. complanatum* a plant collected in Gloucestershire by the Rev. H. P. Reader.

In 1883, in the *Botanical Record Club Report* for 1881–2, p. 236, Mr. F. A. Lees recorded the Gloucestershire plant as *L. alpinum*, emphatically protesting against its being considered *L. complanatum*, and quoting the following extract from a letter from Dr. Boswell to Mr. Bailey :—" Mr. Druce has sent me his own herbarium specimen of *Lycopodium 'complanatum'* from Gloucestershire for inspection. It is (*meo judicio*) pure and simple *L. alpinum*. I should not be surprised if Prof. Lawson's Skye plant turned out (when found fertile) true *L. complanatum* var. *anceps* Wallr., and still more probably the New Forest plant is *L. complanatum* var. *Chamæcyparissus*, but, until gathered in fructification, we cannot be sure that *L. complanatum* is really British." In the supplementary leaflet to the 8th edition of Babington's *Manual*, issued in 1883, *L. complanatum* is described, and the following localities cited :—" Hants, Glouc., Worc., Ross, Skye." In Journ. Bot. 1888, p. 26, Mr. G. C. Druce recorded " *L. complanatum* L., 'Hook. fil.' [whatever that may mean]. Cairngorms, *94, *96, *105."

In view of the uncertainty which seems to exist as to these plants, and of the evident difference between them (at any rate, those of which we have been able to see specimens) and our own undoubted *L. complanatum* from Norway, we have thought it worth while to go through the specimens at Kew and the British Museum. As a result, we feel convinced that *L. alpinum* and *L. complanatum* are fairly distinct species; and that generally, in a country where *L. alpinum* seems to run towards *L. complanatum*, the latter species in its turn seems to be more extreme. For Europe, at any rate, the definitely peduncled inflorescence, with normally more than one spike (suggestive of *L. clavatum*), seems to be a much more reliable character than the size, shape, and arrangement of the leaves; although there is a curious linear appearance about the branches of *L. complanatum*, which, though difficult to describe, is usually sufficiently distinctive. A series of specimens of *L. alpinum* will show every modification, from the small plants occurring in exposed places, with almost terete branches, and leaves nearly the same size, to the large flattened forms of sheltered and heathy localities, with the upper leaves much smaller, and the under leaves almost reduced to the tooth-like form of *L. complanatum*. In these large flattened forms, however, the lateral leaves have a more saw-like appearance than in *L. complanatum*.

Spring evidently relied too much on the leaf characters, and we should therefore not accept his locality "Scotia" without further proof. Lloyd's Bramshot plant we have not seen, but, from the remarks published, we have little doubt that it is the heath form of *L. alpinum*. Prof. Lawson's Skye plant is not different from other big barren flat-branched *L. alpinum*. Mr. Reader's Gloucestershire plant is, from its sessile spikes and general habit, we feel convinced, only a large form of *L. alpinum*. Mr. Druce has kindly lent us the specimens on which his Scotch records are based, and these are evidently *L. alpinum*.

We therefore contend that at present there is no evidence upon which to include *L. complanatum* in the British flora, although, from its distribution, we still hope that it may be found in some of the Scotch forests or such like places.

NOTES ON THE FLORA OF THE FÆROES.

By Miss L. Copland and Miss Caroline Birley.

As information on the Færoese flora is not easily accessible to English readers, a brief record of the plants observed by the writers between June 7th and 28th, 1889, may possibly be of interest. These North Atlantic islands, lying in sixty-two degrees north latitude, and about six to seven degrees west longitude, number thirty-five, many of which are simply rocks, and only seventeen inhabited. Our researches were limited to but three of these,—Stromoe, the largest (27 miles in length and some 7 miles in

breadth); Naalsoe; and a little of the north part of Osteroe. The whole group is of volcanic origin, consisting of basalts and bedded tuffs, with scanty deposits of till or boulder-clay; and there are often peat-bogs, varying in depth from two to six or eight feet, on low ground or gentle slopes.

There is little in this flora to impress the ordinary traveller, save the facts that it greatly resembles that of Britain, and is decidedly poorer. One misses many of the common forms of England and Scotland, finding no shrubs beyond the cherished specimens in gardens; no wayside tangles of briar-roses, blackberry, honeysuckle and hawthorn; and though stunted plants of heather are to be met with, there is no rich growth of them to clothe and colour bleak hillsides. The Færoese flora, like that of the Scottish Highland mountains, is Scandinavian in character, and Herr E. Rostrup, the Danish botanist,* names but five of the 307 phanerogamous or flowering plants of Færoerne as not also found in the Peninsula (Norway and Sweden):—*Alchemilla fissa*, *Anagallis tenella*, *Myosotis repens*, *Scilla verna*, and *Carex Lyngbyei*. Ten are not included among British species, of which five—*Draba corymbosa*, *Papaver nudicaule*, *Angelica Archangelica*, † *Kœnigia Islandica*, and *Carex halophila*—are arctic plants which have their southern limit in these islands; while the remainder:—*Ranunculus glacialis*, *Arabis alpina*, *Potentilla ambigua* (possibly a species not distinct from the English *P. alpestris*), *Polygala amara*, and *Carex Lyngbyei*,—re-appear as alpines of Southern Europe. There is a noticeable absence of umbelliferous plants in field and meadow; and of the only three species of this class:—*Haloscias scoticum*, *Angelica Archangelica*, and *A. sylvestris*—we did not find the last.

Perhaps the best way of recording observations will be presently to state the species noticed by us in the varied habitats—cultivated ground, low slopes of hills, ravines, sea-shore, cliffs, among the rocks of the trap terraces, and on the mountain heights. A few plants—the spotted palmate orchis and the alpine lady's mantle, for example—occur in many situations. Grasses, sedges, and rushes are abundant and varied, and, being a feature in alpine vegetation, we much regretted our inability to distinguish their species, and likewise the mosses and lichens, which cover the large angular blocks of stone thickly scattered on the hills. *Lecanora tartarea* and *Parmelia saxatilis* (*Lichen tartareus* and *L. saxatilis* of Landt, a Danish writer on the Færoes early in the century) are much used by the Færoese for red and brown and purple dyes for home-spun cloth, and are called by them *Korkje* and *Stajnamosi*. The

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* Færoernes Flora, en floristisk skitse, hovedsagelig grundet paa udbyttet af rejser paa disse oer, foretagne i sommeren 1867 af cand. phil. C. A. Feilberg og seminarielærer E. Rostrup. Af E. Rostrup (Särskild aftryk af *Botanisk Tidskrift*. Kjobenhavn, 1870).

† Of these ten plants mentioned by Rostrup as not occurring in England, three, viz., *A. Archangelica*, *P. amara* (Teesdale and E. Kent), and *Arabis alpina* (I. of Skye), are admitted to our lists. We do not, however, possess *Saxifrage grœnlandica* L., and one or two others which he does not name as foreign to our country.—J. C. M.

seaweed, *Fucus nodosus*, supplies them also with a green. One hundred and ninety species of Algæ are enumerated as occurring in the Færoes, but we ourselves only met with a few very ordinary kinds. In the 612 species of Færoese Cryptogams given by Rostrup are, besides the Algæ, 23 "Karkryptogamer" (Vascular Cryptogams, including Ferns, Mare's-tails, and Club-mosses), 2 Characeæ, 155 Mosses, 50 Liverworts, 142 Lichens, and 50 Fungi. A little ravine near Westmanshavn, Stromoe, shows a more than usually luxuriant growth of ferns, which, speaking generally, are in these islands small, poor specimens as compared with those of British growth. Such are the polypody, hard fern, and common bracken; but the graceful *Cystopteris fragilis* does well in many places, sheltered in deep crevices of rock. There are 14 species of Filices.

The absence of trees is very striking. Four or five species of willow—one the small creeping *Salix herbacea*—and the dwarf form of juniper (*Juniperus communis* var. *nana*) occurring sparingly, are the only indigenous kinds; and Rostrup names four foreign willows, the sycamore (*Acer pseudo-platanus*), and the mountain ash or rowan (of which there are old and well-grown specimens in the Governor's garden), as the trees which flourish best in the Færoes. But even those that flourish rarely grow much above the stone dykes, &c., which shelter them from the wind, and are more admired by residents than strangers. Yet the peat-mosses, where roots, twigs, and even pieces of wood as thick as a man's wrist are common, give evidence that the lower ground of the islands was once fairly well covered with brushwood and small trees. The wood is chiefly juniper and birch. Ripe strawberries have been gathered from imported plants, but there is a great scarcity of native fruit. The cranberry and cloudberry are absent; and though the dwarf form of the bilberry (*Vaccinium Myrtillus*) exists, it rarely affords berries here. Stone-brambles, however, occasionally yield a scanty crop, while crowberries are comparatively plentiful, and tradition tells it was to these a bishop of Kirkeboe, in Stromoe, prior to the Reformation, had recourse for making wine required for the church services.

The list of our discoveries in the enclosed fields about Thorshavn (the capital of the Færoes), with their numerous little watercourses, comprises the common daisy, dandelion, buttercup (*Ranunculus repens*), four kinds of dock, ragged robin, *Lychnis Flos-Cuculi* (in profusion), cuckoo-flower (*Cardamine pratensis*), and king-cups or marsh marigolds (*Caltha palustris*), which almost fill the channels in the lower meadows with a rich luxuriance of flower and foliage. Many of these marigolds have extra petals; a cluster of three flowers' each possessing seven and even eight petals, is not infrequent. On the drier ground of little knolls, eyebright (*Euphrasia officinalis*), and the common lady's mantle (*Alchemilla vulgaris*) occur, as well as *A. alpina*. At Eide, in Osteroe, we found a wild geranium, *G. sylvaticum*.

Beyond the enclosed land, on the low slopes of hills, pasture of short grass and sedges stretches upwards, broken only by the rocky

walls of the trap terraces. The bog-land furnishes abundance of peat for fuel, but there is little variety in the plants. We found the common butterwort (*Pinguicula vulgaris*) in plenty; also cotton-grass (*Eriophorum angustifolium*), spearwort (*Ranunculus Flammula*), and a *R. acris;* the small St. John's wort (*Hypericum pulchrum*), the heath bedstraw (*Galium saxatile*), and a stray plant of bog-violet (*Viola palustris*); and, where the ground was not so moist, ling-heather (*Calluna vulgaris*), stunted and with little flower; much crowberry (*Empetrum nigrum*), milkwort (*Polygala vulgaris*), dog-violet, thyme, alpine meadow rue (*Thalictrum alpinum*), and *Potentilla Tormentilla*, which is employed in tanning the ordinary sheep-skin shoes. On damp rocky ground near Eide, in Osteroe, we noticed the pretty little crimson stonecrop (*Sedum villosum*). The starry saxifrage (*Saxifraga stellaris*) grows by tiny rills; and *Bartsia alpina* was gathered beside a larger stream above Siov, Kollefiord, Stromoe, where too we saw fair-sized fronds of lady-fern (*Athyrium Filix-fœmina*).

Where the lines of rock at the base of each successive slope form cliffs at various heights along the hills, or some little ravine like that at Westmanshavn, plants grow with greater vigour. Besides the ferns, we found roseroot (*Rhodiola rosea*), mountain sorrel (*Oxyria reniformis*), and also, upon stony ground on Naalsoe, a pretty little alpine saxifrage (*Saxifraga hypnoides*) with delicate white flowers.

Odnadalstind (2400 feet), on the Kollefiord, the only mountain we ascended, was the scene of our more interesting plant-finds. Not far up the hill we came on the dwarf cornel (*Cornus Suecica*), about four inches high, the berries of which are said to fatten bears. "Poor bears! It must take a long time," was the pitying reflection. At the first glance this seemed a white-petalled, dark-centred, solitary flower; but on examination the tiny brownish purple specks proved to be the cluster of blossom enclosed by four pale bracts. Higher was the short thick alpine club-moss (*Lycopodium Selago*), alpine chickweed (*Cerastium latifolium*); a kind of scurvy-grass, probably *Cochlearia arctica;* an alpine form of thrift or sea-pink, with almost stemless heads, and flowers deeper in colour than the ordinary type of *Armeria maritima;* moss-campion (*Silene acaulis*), and a dwarf variety—*pumila*—of *Ranunculus acris.* At a still higher elevation, some 2,000 feet, on bare stony ground, grows *Ranunculus glacialis,* a beautiful little plant with crimson flowers instead of the more ordinary white, which last were gathered the following summer, by one of the writers, on another side of the mountain at the same altitude.

With more leisure for a search, the low-lying islet, Kirkeboe-holm, might have yielded uncommon plants; but in our brief visit, we noticed nothing but *Angelica Archangelica* and *Lychnis diurna,* already mentioned; and on the shore of Stromoe opposite, silver-weed (*Potentilla Anserina*) and sandwort (*Arenaria peploides*). On the low rocks by the sea, at other places on the coast, ordinary thrift and the sea-plantain (*Plantago maritima*) occur. Our collection also contained specimens of a dwarf sea-plantain, which we

believe we found both fairly high on Odnadalstind and on low ground near Thorshavn. That we have no note of its exact localities is unfortunate, as on our return to England this plant excited the interest of Mr. J. Cosmo Melvill, who at once pronounced it *Plantago maritima* L., form *pumila* (Kjellman), and had lately read a paper before the Manchester Literary and Philosophical Society, recording for the first time its occurrence in Great Britain, on Ben Hope, in North-West Sutherlandshire, at an altitude of about 2,900 feet. "This form," says Mr. Melvill, "of an abundant plant throughout our country, especially near the sea-coast, mainly differs from the type in the shortness of the leaves, also their not being at all fleshy, and in the isolated growth of individuals, the leaves forming a rosette round the central root-stock. In the round flower spikes it resembles *Plantago alpina* (L.)." It was first collected in the Nordenskjold expedition of 1875, at Cap Grabering, Insula Wajgatsch, Scandinavia, by the botanists Kjellman and Lundström; and a specimen is in the Kew Herbarium. Mr. J. G. Baker, F.R.S., of Kew, observes that "a very similar form grows in Teesdale, on the sugar limestone of Widdy Bank Fell."

The Færoese have a great love of flowers, and very many of the little windows in Thorshavn are adorned with blossoming rose and fuchsia plants. For the latter they have a name —"The Blood of Christ"—we have not elsewhere met with; and primroses, which under cultivation grow well out of doors, and were originally brought from France by sailors, are called "French grass." Much pride is taken in the gardens, where rhubarb, radishes, potatoes, turnips, currants, gooseberries, and angelica are the edible products, and one finds quite a number of more ornamental plants. These are monk's-hood (*Aconitum Napellus*), pæony (*Pæonia officinalis*), London pride (*Saxifraga umbrosa*), blue perennial cornflower (*Centaurea montana*), purple honesty (*Lunaria biennis*), globe flower *Trollius europæus*), bachelor's buttons (*Ranunculus aconitifolius*), fl. pl., here known as "silver buttons," scarlet poppy (*Papaver orientale;* yellow Turk's-cap lily (*Lilium pyrenaicum*), *Astrantia major*, yellow flag (*Iris Pseudacorus*), double pink campion (*Lychnis diurna*), fl. pl., forget-me-not (*Myosotis palustris*), pansy (*Viola tricolor*), snakeweed (*Polygonum Bistorta*), and blue lupine (*Lupinus perennis*).

With regard to crops, barley, which generally ripens, is the staple; but there are a few patches of oats about Thorshavn, and rye grass, timothy grass, and red clover are occasionally tried. Potatoes and turnips both do well: but the steep unequal nature of the ground, and the lack of sunshine, preclude the possibility of much culture of the land.

LIST OF PLANTS OBTAINED BY THE ABOVE.

By James Cosmo Melvill, M.A., F.L.S.

This collection, made at my request, and under considerable difficuties, though numbering only between eighty and ninety species, is of great interest, considering how very rarely British

botanists have ever visited these islands. Nearly sixty years ago, Sir W. C. Trevelyan wrote on the subject, "On the Vegetation and Temperature of the Faröe Islands," *Edinburgh New Philosophical Journal*, January, 1835, followed by a reprint, with additions and corrections, 1837, since which time but little was published on this flora till E. Rostrup's more ample catalogue, 1870; and during the past fifteen or twenty years one or two plants only, notably *Erica Tetralix* (L.) from Süderoe, collected by Mr. Backhouse in Sept., 1884, have been added. The following catalogue contains nearly a third of the plants known to occur in the islands, many of which, so early in the year as June, could not be flowering, and consequently were left ungathered. My best thanks are due to Miss Birley and Miss Copland for presenting me with their collections for my herbarium, and also to Mr. Arthur Bennett, F.L.S., for kindly giving his opinion on one or two of the few critical specimens.

Ranunculaceæ.
Thalictrum alpinum *L.*
Ranunculus acris *L.*
R. acris *L.*, *var.* pumilus.
R. glacialis *L.*
R. Flammula *L.*
R. repens *L.*
Caltha palustris *L.*—Obs. The *Caltha* very luxuriant and fine. *R. glacialis* with deep crimson petals.
Cruciferæ.
Arabis petræa *L.* — Variable; some specimens almost sessile.
Cardamine pratensis *L.*
Cochlearia arctica *DC.*
C. Danica *L.*
C. officinalis *L.*
Portulacaceæ.
Montia fontana *L.*
Violaceæ.
Viola sylvatica *L.*
V. palustris *L.*
Caryophylleæ.
Silene acaulis *L.*, *var.* exscapa.
Lychnis Flos-Cuculi *L.*
Melandrium diurnum *Sibth.*
Cerastium triviale *Gm.*, *var.* alpestre *Lindb.*
C. alpinum *L.*
C. latifolium *L.*
Alsine (Halianthus) peploides *L.*
Polygalaceæ.
Polygala vulgaris *L.*
Hypericaceæ.
Hypericum pulchrum *L.*
Geraniaceæ.
Geranium sylvaticum *L.*
Acerineæ.
Acer Pseudo-platanus *L.* — Planted only.
Leguminaceæ.
Lotus corniculatus *L.*
Trifolium pratense *L.*
Roseaceæ.
Alchemilla alpina *L.*
A. vulgaris *L.*
Potentilla Anserina *L.*
P. Tormentilla *Scop.*
Pyrus Aucuparia *L.*—This last not indigenous.
Saxifrageæ.
Saxifraga cæspitosa *L.*
S. grœnlandica *L.*
S. hypnoides *L.*
S. stellaris *L.*
S. cæspitosa *L.*, occurs in two forms: one smooth, the other with downy leaves and foot-stalk.
Crassulaceæ.
Rhodiola rosea *L.*
Sedum villosum *L.*
Umbelliferæ.
Angelica Archangelica *L.* (A. officinalis *Hoffm.*).
Ligusticum Scoticum *L.*

Cornaceæ.
Cornus Suecica, *L.*
Rubiaceæ.
Galium saxatile *L.*
Compositæ.
Bellis perennis *L.*
Leontodon Taraxacum *L.*
Hieracium, *sp.*—Obs. Now the species of this genus are being so assiduously worked out, especially in connection with North British and Scandinavian forms, it is to be hoped that those of the Faröese flora will receive, before long, their due meed of attention. Rostrup mentions the following as occurring in the Islands, names mostly now used as aggregate terms:— *H. Pilosella, alpinum, murorum, vulgatum,* and *tridentatum.*
Ericaceæ.
Calluna vulgaris (*Salisb.*). [C. Erica *DC.*].
Plumbagineæ.
Armeria vulgaris *Willd.* — Hardly the usual form. Leaves very narrow, linear, short, stem pubescent; heads round; bracts (outer) ovate, deep crimson, inner bracts whitish. A very beautiful [variety.
Boragineæ.
Myosotis arvensis *L.*
M. repens (*Don.*).
Scrophularineæ.
Euphrasia officinalis *L.*
Bartsia alpina *L.*
Rhinanthus minor *Ehrh.* — Note. Several species of *Veronica* occur in the island, none, however, were gathered in this collection. They are the same as the commoner British forms.
Labiatæ.
Thymus Serpyllum *L.*
Galeopsis Tetrahit *L.*
Prunella vulgaris *L.*
Lentibulariæ.
Pinguicula vulgaris *L.*
Plantagineæ.
Plantago lanceolata *L.*
P. eriophylla *Desv.*
P. maritima *L.*
P. pumila *Kjellmann.*
Polygoneæ.
Oxyria digyna *L.*
Rumex acetosa *L.*
R. obtusifolius *L.*
Amentiferæ.
Salix herbacea *L.*
Empetraceæ.
Empetrum nigrum *L.*
Coniferæ.
Juniperus nana (*Willd.*).
Potomaceæ.
Potamogeton polygonifolius *Pourr.*
Orchidaceæ.
Orchis maculata *L.*
Liliaceæ.
Narthecium Ossifragum *Huds.*
Juncaceæ.
Juncus triglumis *L.*
J. squarrosus *L.*
Luzula campestris *L.*
L. spicata *L.*
Cyperaceæ.
Carex Hornschuchiana *Hoppe.*
C. vulgaris *Fr.*
Eriophorum vaginatum *L.*
E. angustifolium *Roth.*
Gramineæ.
Anthoxanthum odoratum *L.*
Deschampsia alpina *L.*
Phleum pratense *L.*
Filices.
Polypodium vulgare *L.*
Cystopteris fragilis *Bernh.*
Athyrium Filix-fœmina *L.*
Blechnum Spicant *Roth.*
Pteris aquilina *L.*
Lycopodiaceæ.
Lycopodium Selago *L.*

SHORT NOTES.

Chrysosplenium alternifolium in West Kent.—While botanising in the neighbourhood of Ide Hill, near Sevenoaks, W. Kent, in April last, I found *Chrysosplenium alternifolium* between Ide Hill and Toys Hill. Watson, in *Top. Bot.* ed. 2, records this species for W. Kent, with the remark, "error of species?" On writing to the Rev. E. S. Marshall, he kindly informed me that probably the doubt was due to the locality for this plant in W. Kent ("Charlton Wood") being a doubtful one, as perhaps only *C. oppositifolium* grows there. The other station on record, "High Rocks, Tunbridge Wells," may be in E. Sussex or W. Kent. On revisiting the Ide Hill locality, I found the species abundant in a few spots in the neighbourhood, *viz.*, in the swampy part of the little wood, on the right of the footpath from Ide Hill to Toys Hill, just before coming to the bridge over a stream; by the little stream in the field the other side of the bridge; and very plentifully in the wet part of the woods through which the stream runs, before and after passing through this field; and also in the alder copse, and in a field near it, close to the farmhouse at the Toys Hill end of the footpath. *C. oppositifolium* and *Allium ursinum* grow with it in most of these places.—Ernest S. Salmon.

Lycopodium complanatum L.—I recently looked up the type ot this in Linné's herbarium, and am convinced that the Gloucestershire plant figured in this Journal for 1882, page 321, must go under *L. alpinum* L. Last July I gathered exactly the same form in Perthshire, and all British "*complanatum*" which I have seen is similar. In my opinion, the species ought to disappear from our list, on present knowledge.—Edward S. Marshall.

Geographical Distribution of Potamogeton javanicus Hassk.—Having lately been at Kew, studying South African plants, I also looked at the Potamogetons, and am now able to add to my list (in *Berichte der schweiz. Bot. Gesellschaft*, Heft 1, p. 60) the following numbers, in addition to those already quoted by Mr. Bennett in the April and May numbers of this Journal:—

African Continent.—Sudan (*Schweinfurth* 1225, 2909).
Madagascar.—*Baron* 524, 995, 4113. *Hildebrandt* 3524.
India.—From different localities by *Hooker & Thomson*.
Japan.—*Makino*.

As Makino's plant has no ripe fruit, I am not quite sure of the correctness of my determination. Makino left his specimen unnamed. What he distributes as *P. hybridus* Mich, is undoubtedly *P. cristatus* Regel et Maack.—Hans Schinz.

Pyrus cordata Desv. — The *Pyrus* which grows so freely about Caldas do Gerez, in Northern Portugal, must be referred to this species, and not to *P. Achras* Wallr. For this correction I am indebted to my dear friend, T. R. A. Briggs, who in July last examined carefully my set of *Pyrus* and *Sorbus*. As soon as he saw the Portuguese plant, he exclaimed, "That is *Pyrus Briggsii*." A comparison with the Plymouth plant followed, but only confirmed his first impression. This is an interesting extension of the range

of *P. cordata*. Nyman says of it, "Species probabiliter e Persia oriunde," but I think it has every claim to be regarded as indigenous in the Gerez.—R. P. MURRAY.

NOTICES OF BOOKS.

The Diseases of Crops, and their Remedies. By A. B. GRIFFITHS. London: Bell & Sons. 1890. 8vo, pp. 174, 51 cuts. Price 2s. 6d.

"THE main object of this little volume is to detail in a concise (*sic*) form the life-histories of the principal insect and vegetable foes of the farm, and to give an account of the means for destroying them, or preventing their attacks." A good deal of practical information is given in this book, and, so far as it is botanical, we have found few positive inaccuracies in the text; but, on the other hand, it lacks the merits of clearness and of freedom from technicalities; and this want will hardly add to its usefulness in the hands of farmers and market-gardeners, to whom it is principally addressed. In some respects, such as copiousness, it is an improvement on any of the other little books on the subject. The illustrations are bad and scrappy—some of those depicting leaf-structure and the like are fearfully and wonderfully made. The author holds staggering views on nomenclature, as set forth on pp. 6 and 7. Well for him that the Editor of this Journal is not the writer of this notice! G. M.

Botanisches Adressbuch. Verzeichnis der lebenden Botaniker, sowie der botanischen Anstalten, Gesellschaften und Zeitschriften herausgegeben von Fachmänneren. Leipzig: Engelmann. 1891. 8vo, pp. 186. Price 4 marks.

SINCE the death of Prof. Morren, a successor to his *Correspondance Botanique*, of which the last edition appeared in 1884, has been urgently needed; and Herr Engelmann is to be thanked for the volume now before us. It is based on the lines laid down by Morren, but is of more convenient size and print than the *Correspondance Botanique*; and it is of course indispensable to botanists.

A prefatory note, couched in various languages, tells us that "The botanists are begged, in the interest of the botanic science, to inform the editor of all changes and corrections." We fear that these will be more numerous than the editor expects, and we would suggest to him that it would be advisable, instead of trusting to the complaisance of "the botanists," to forward proof-sheets of the next edition to representatives of the various countries, and invite their corrections. We will gladly undertake such corrections for these islands, and we are sure that others will gladly combine to make a publication of this kind as complete and accurate as possible.

At present it must be admitted that there is room for improvement, both in spelling and arrangement. The Linnean Society's list would have enabled the compiler to render his addresses more

complete. Some names, such as that of Mr. W. S. Dallas, hardly claimed admission among botanists when their owner was alive, and certainly need not be retained after his death; Mr. Hobkirk has not been at Huddersfield for many years, and Mr. Melvill will be surprised to find Prestwich transported into Scotland. The name of this Journal is not "Trimen's Journal of Botany"; the Royal Horticultural Society is not at South Kensington, and Dr. Masters is neither its Secretary nor editor of its Journal; while "florist" does not mean, as Herr Engelmann seems to suppose, the writer of a flora. These and similar mistakes will disappear in the next edition, if the suggestion we have made above be adopted by the compiler.

NEW BOOKS.

J. Costantin & L. Dufour.—'Nouvelle Flore des Champignons.' 8vo, pp. xxxviii. 255, 3842 cuts. Paris, Dupont. 6 fr.

J. Hérail & V. Bonnet.—'Manipulations de Botanique Médicale.' 8vo, pp. 320, tt. 36, 223 figs. Paris, Baillière. 20 fr.

J. Héribaud.—'Analyse descriptive des Rubus du plateau central de la France.' 8vo, pp. 31. Clermont-Ferrand, Rousseau.

G. Henslow.—'The Making of Flowers.' 8vo, pp. vii. 168, 24 cuts. London, S.P.C.K. 2s. 6d.

F. Hueppe.—'Die Methoden der Bakterien Forschung.' 5th edition. 8vo, pp. viii. 495, tt. 2, 68 cuts. Wiesbaden, Kriedel.

L. Klein.—'Seubert's Exkursionsflora für das Grossherzogtum Baden.' Fünfte Auflage bearbeitet von Dr. L. Klein. 8vo, pp. vi. 42, 434. Stuttgart, Ulmer.

H. Mayr.—'Monographie der Abietineen des Japanischen Reiches.' 4to, pp. viii. 104, tt. 7. München, Himmer.

L. Paolucci.—'Flora Marchigiana.' 8vo, 1 vol. text, pp. xxv. 655; 1 vol. plates (44). Pesaro, Federici. 20 l.

T. Jeffery Parker.—'Lessons in Elementary Biology.' 8vo, pp. xi. 408, 89 cuts. London, Macmillan. 10s. 6d.

ARTICLES IN JOURNALS.

Annals of Botany (April).—F. O. Bower, 'Is the Eusporangiate or the Leptosporangiate the more primitive type in the Ferns?' (1 plate).—T. Johnson, 'Observations on Phæozoosporeæ' (1 plate).—C. A. Barber & W. T. T. Dyer, 'The Structure of Pachytheca' (1 plate). — J. G. Baker, 'Vascular Cryptogamia of St. Vincent' (2 plates). — Id., 'New Ferns discovered or described since 1874' (1 plate). — D. H. Scott, 'Points of Anatomy of *Ipomæa versicolor*.' H. C. Webber, 'Antheridium of *Lomentaria*.'

Ann. Sciences Naturelles (May).—P. van Tieghem, 'Structure et affinités des Mémécylées' (1 plate). — H. Douliot, 'La croissance terminale de la tige et de la feuille chez les Graminées' (1 plate).—C. Savageau, 'Sur les feuilles de quelques Monocotylédones aquatiques.'

Bot. Centralblatt. (Nos. 18–22).—P. Schumann, 'Zur Kenntniss der Greuzen der Variation im anatomischen Bau derselben Pflanzenart.' — (No. 18). F. Schindler, 'Ueber die Stammpflanze der Runkel- und Zuckerrüben.'— (No. 19). F. Berg, 'Roggenzüchtung 1890.'— R. Gemböck, 'Moose und Lichenen im Bergwalde der Oberösterr. Kalkalpen.' — (Nos. 21, 22). J. Röll, 'Vorläufige Mittheilungen über die von mir im Jahre 1888 in Nord-Amerika Gesammelten neuen Varietäten und Formen der Torfmoose.'

Botanical Gazette (April).—J. M. Coulter, 'New or noteworthy Compositæ from Guatemala' (*Eupatorium Donnell-Smithii*, *E. lyratum*, *E. Rafaelense*, *Brickellia Parayensis*, *Aphanostephus Pinulensis*, *Clibadium Donnell-Smithii*, *Tetragonotheca Guatemalensis*, *Zexmenia Dulcis*, *Bidens Antiguensis*, *Senecio Donnell-Smithii*, *S. Cobanensis*, spp. nn.).—M. S. Bebb, 'Willows of California.'—E. J. Hill, 'Flora of St. Croix region.'—J. N. Rose, *Aster Orcuttii*, sp. n. (1 plate). — F. W. Anderson, *Fomes virginianus*, sp. n. (1 plate).—B. L. Robinson, *Silphium laciniatum*. — C. A. Davis, 'Propagation of *Ranunculus lacustris*.' — (May). W. F. Ganong, 'Raised Peat-bogs in New Brunswick.' — E. J. Hill, 'Flora of St. Croix region.' —A. J. Hitchcock, 'A Visit to the West Indies.' — D. M. Mottier, 'Apical Growth of Liverworts' (1 plate). — J. M. Coulter, 'New *Solanaceæ* from Guatemala' (*Solanum Donnell-Smithii*, *Brachistus Escuitlensis*, *Bassovia Donnell-Smithii*, spp. nn. — G. Vasey, 'New Grasses' (*Orcuttia Greenei*, *Eragrostis spicata*, *Muhlenbergia Alamosæ*, *Calamagrostis densus*, *C. koelerioides*, spp. nn.). — 'A Caution as to Nomenclature.'

Botanical Magazine (Tokio: April). — R. Yatabe, '*Acrostichum Yoshinagaæ*, sp. n. (plate).

Bot. Zeitung (Ap. 24).—G. Karsten, *Delesseria amboinensis*, sp. n. (1 plate).—(Ap. 24–May 15).—C. Wehmer, 'Entstehung & physiologische Bedeutung der Oxalsäure im Stoffwechsel einiger Pilze.'—(May 8). A. Hausgirg, 'Ueber die Bacteriaceen gattung *Phragmidiothrix* Engler und einiger *Leptothrix* Ktz.-Arten.'

Bull. Torrey Bot. Club (April). — A. F. Foerste, 'Formation of flower-buds of spring-blossoming plants during the preceding summer.'—N. L. Britton, Rusby's S. American Plants ((*Manettia? diffusa*, *Coccocypselum glabrum*, *Hoffmannia brachycarpa*, spp. nn.).—E. J. Hill, 'Fertilisation of *Campanula aparinoides*, *Sabbatia angularis*, & *Eleocharis mutata*.' — W. T. Davis, 'Variations of rootstock of *Smilax glauca*.'—A. M. Vail, *Desmodium Lindheimeri*, sp. n.

Gardeners' Chronicle (May 2).—*Cirrhopetalum elegantulum* Rolfe, sp. n.—(May 16). *C. Wendlandianum* Kranzlin, sp. n.

Journal de Botanique (Ap. 16).—P. van Tieghem, 'Sur les tubes criblés extralibériens et les vaisseaux extraligneux.'—H. Devaux, 'Circulation passive de l'azote dans les végétaux.'—(Ap. 16–May 16). E. Bureau & A. Franchet, 'Plantes nouvelles du Thibet et de la Chine occidentale' (new species of *Pedicularis*, *Phteirospermum*, *Incarvillea*, *Phlomis*, *Ajuga*, *Polygonum*, *Daphne*, *Hemipilia*, *Habenaria*, *Fritillaria*, *Chlorophytum*, *Allium*, *Aletris*, *Tofieldia*).—(May 1). P. van Tieghem, 'Structure et affinités des Primevères du Thibet

et de la Chine.'—E. Bescherelle, 'Selectio Novorum Muscorum.'—(May 16). G. Beauvisage, 'Sur les fascicules criblés enclavès dans le bois secondaire de la Belladone.'

Journ. Linnean Soc. (Bot. xxvii. 187–8, Ap. 25). — G. Massee, Life-history of *Dictyosphærium Ehrenbergianum* (1 plate). — T. Johnson, 'Systematic position of *Dictyotaceæ*.' — J. Ball, 'Further Contributions to Flora of Patagonia.' — S. Le M. Moore, 'Investigations into true nature of Callus.'—Id., 'Microchemical Reactions of Tannin.'

La Notarisia (April 30). — P. Magnus, 'Nuova contribuzione alla conoscenza dell' area geografica di *Sphæroplea annulina*.' — P. Hariot, 'Algues du Brésil et du Congo.'—M. Möbius, 'Conspectus algarum endophytarum.'

Oesterr. Bot. Zeitschrift. (May).—A. v. Degen, *Arenaria rotundifolia & A. transsylvanica.* — L. Celakovsky, 'Ueber die Verwandtschaft von *Typha* und *Sparganium*.' — A. Zahlbruckner, 'Zur Kryptogamenflora Oberösterreichs.' — H. Polâk, 'Zur Flora von Bulgarien.' — E. Junger, 'Botanische Gelegenheits bemerkungen.' R. R. v. Wettstein, 'Ueber die Section *Laburnum* der Gattung *Cytisus*.'

BOOK-NOTES, NEWS, &c.

Mr. Worthington G. Smith is preparing for the public gallery of the Botanical Department of the British Museum a series of ninety-six tables, illustrating the British Fungi. Every species of the Hymenomycetes will be figured in its natural colours, the drawings being taken from Mr. Smith's own series, already in the Museum, with others from original figures lent by Mr. Plowright and others.

A handsome volume on *The Missouri Botanic Garden* has been issued by its Trustees, under the editorship of Prof. Trelease. It contains a biographical sketch, with portrait, of Henry Shaw, to whose generosity the garden owes its establishment and maintenance. Mr. Shaw was born in Sheffield, on July 24, 1800, his father being a manufacturer of grates, &c., in that town. He was educated at Mill Hill, and in 1818 went to Canada with his father, by whom in the same year he was sent to New Orleans. Thence he went to St. Louis, where he amassed a large fortune. The Missouri Garden was begun by him in 1857, and its development occupied him from that date. He died at St. Louis, in his residence in the Gardens, on August 25th last. Mr. Shaw appears to have had no knowledge of Botany, but his name deservedly occupies a place among the "patrons" of that science.

We learn from the recently issued "Report of the Manchester Museum Owens College," that Mr. H. C. Watson's European herbarium has been transferred into new cases, and is available for reference.

Baron von Mueller is continuing his useful *Iconographies of Australian Plants*. Of the most recent, devoted to the *Salsolaceæ*,

six parts have now been issued, containing excellent representations of *Atriplex* (20 species), *Rhagodia* (5), *Chenopodium* (8), *Dysphania* (3), *Babbagia* (4), and *Kochia* (20). The Baron has published two new genera in the *Victorian Naturalist* for March—*Haplostichanthus* (Anonaceæ) and *Schistocarpaea* (Rhamnaceæ), allied to *Colubrina*.

In the last (April) number of the *Annals of Botany*, Mr. Dyer calls in question the statement of Messrs. Batters and Holmes that "Mrs. Gray's own type-specimens are at Cambridge University." "I can hardly doubt," he adds, "that Mrs. J. E. Gray enriched the Kew Herbarium of Algæ, which was practically for some years under her charge, with any specimens of her own which would be of value to it." This suggestion might with equal plausibility be advanced with regard to the British Museum Sea-weeds, which also had the somewhat questionable advantage of Mrs. Gray's supervision: but the facts of the case entirely negative such a view. Mrs. Gray's Algæ, as stated in this Journal for 1877, p. 32, are at Cambridge, as the following note from Prof. Babington conclusively shows:—"There is no doubt that we have both Dr. and Mrs. Gray's Herbarium of Algæ. We received them in 1877. In the *Cambridge University Reporter* for that year, p. 430, will be found my notice of their receipt, as follows:—'The late Dr. J. E. Gray gave his whole collection of Algæ to this Herbarium a short time before his death. He sent them in the cabinet in which he had arranged them, and in which they remain. His death was soon followed by that of his wife, Mrs. Emma Gray, . . . who made a large and beautifully preserved collection of species, mostly different from those in Dr. Gray's cabinet. These she desired her executors to give to the University, and they are in this Museum.' There are eleven packets of them, as they were kept by her." Mrs. Gray did not publish any new species, so that it is not quite clear what is meant by her "own type-specimens."

The last part (March) of the *Journal of the Royal Agricultural Society of England* publishes an extravagant eulogy of Mr. M. J. Sutton's *Permanent and Temporary Pastures*, of which a new edition has lately been issued. Mr. Sutton's book is a useful one, and has its good points, but is certainly not entitled to praise of so lavish and undiscriminating a nature.

Mr. F. M. Bailey sends us his second *Contributions to the Queensland Flora*, issued in the March *Bulletin* of the Brisbane Department of Agriculture. It contains descriptions of several new species, including four Cryptocaryas, and an account of *Erythroxylon ellipticum* Br., only previously known from specimens collected by Robert Brown in 1803.

OBITUARY.

Henry Groves was born at Weymouth in 1835. He was educated in London, and apprenticed to his father, whose occupation—that of a pharmacist—he followed throughout his life. In 1856 he obtained the Pharmaceutical Society's certificate in the

examination for botany, a study to which he was always devoted. While at Weymouth he carefully examined the botany of the district; his essay on "The Flora of Portland"—which had previously been read at a meeting of the Phytological Society of London, to which body he forwarded several papers—appears in the *Phytologist*, N. S., ii. 601–9 (1858). About 1862 he went to Florence, to take part in a pharmacy then recently established; of this he soon became the proprietor, and his shop was a well-known resort for English-speaking residents. Here he resided until his death, which took place on the 1st of March; he was buried in the Protestant cemetery at Florence.

Mr. Groves became a Fellow of the Linnean Society in 1884, and his principal contribution to science appeared in its Journal for 1886. This was an essay on "The Coast Flora of Japygia" (now known as the province of Lecce) in South Italy, and was intended as an analysis of a flora of the district which he intended to publish "at no distant date," but which has not appeared. It contains descriptions of new forms of *Centaurea* and *Anthemis*, and of a variety of *Ornithogalum refractum* which he named *Adalgisa* after his wife, a Genoese lady, whom he married in 1871, and who shared in his botanical tastes and excursions. These latter, says the *Pharmaceutical Journal* of March 28, "were undertaken during the summer, when business at Florence comes to an almost complete standstill, and were often continued for six weeks at a stretch, the most out-of-the-way and unexplored localities being chosen for investigation. In turn were visited Monte Argentaro, the Maremma, the Abruzzi (including Monte Marrone, Monte Majella, &c.), the Appian Alps, Monte Gioja, the Appenines, South Italy (including Otranto, Taranto and Gallipoli, Sicily and Tunis). Some of these trips exposed the party to considerable privations, owing to the absence of places of shelter other than that offered by the squalid cabins of shepherds, or the more wholesome, if somewhat airy, refuge afforded by caverns. The necessaries of life had to be carried on mule back, and the only meat obtainable was "miscischia," the salted and air-dried flesh of some unfortunate sheep or goat, killed by falling from a precipice. *Chenopodium Bonus-Henricus* was found not a bad substitute for the usual green food of civilisation. In this way Mr. Groves amassed a very large collection of dried plants, and obtained a knowledge of Italian botany not perhaps excelled in his day. In addition to the plants of his own collecting he acquired a vast number of European species by means of exchange with the numerous small exchange societies to which he was affiliated. At the time of his death the total number of specimens in his herbarium amounted to close upon 50,000, the arrangement and custody of which had absorbed the greater part of his spare time. The whole of these, with the exception of a comparatively small number of cryptogams, has been left to the Central Botanical Society of Tuscany, of which society he was one of the founders. It is to be regretted that an exhaustive paper on *Statice*, his favourite genus, was left at his death unfinished.

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British Museum Natural History), South Kensington.

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☞ *The Map referred to at p. 209 is unavoidably postponed*

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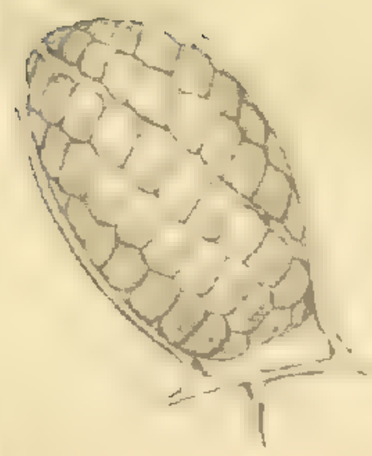
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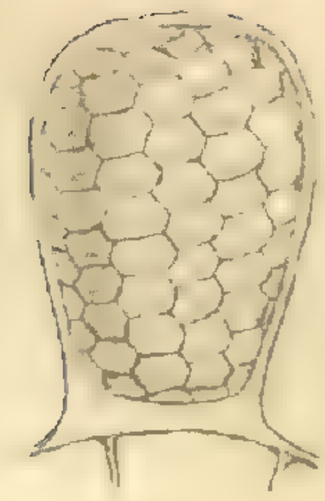
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Stictosiphon Decaisnei *G.Murr.*

ON *CLADOTHELE* Hook. F. et Harv. (*STICTYOSIPHON* Kütz.)

By George Murray, F.L.S.

(Plate 306.)

The genus *Cladothele* was first published in the *Algæ Antarcticæ* of Hooker and Harvey in the *London Journal of Botany*, 1845, vol. iv. p. 293, and subsequently the publication was repeated, with an illustration, in the *Flora Antarctica*, Part ii. p. 491, tab. 190. The latter is often quoted as the original. The original description runs:—"Frons cylindrica, filiformis, viridis, solida, ramosa, extus papillosa. Axis cellulosa, densa, e cellulis magnis hyalinis, vacuis cellulam centralem radiatim cingentibus, formata. Peripheria cellulosa, cellulis coloratis (viridibus) pluriseriatis. Utriculi papillæformes, totam superficiem vestientes.—Alga marina Falklandica, irregulariter ramosa, sordide viridis, ecorticata."

The species described, *Cladothele Decaisnei*, was found in the sea, at Berkeley Sound, Falkland Islands, during the voyage of the 'Erebus' and 'Terror.' In the specific description the authors add to their statement as to its colour, "siccitate cinerascens," and that it then adheres loosely to paper. "A very curious plant, certainly related to *Codium*, especially to *C. simpliciusculum*, by the structure of the papillæ that cover the surface, and from which we have derived the generic name, but with an axis of very different structure from that of *Codium* or of any other siphoneous genus. It indeed more closely resembles *Polysiphonia*" (*loc. cit.*, p. 294). This puzzling description was not made any clearer, so far as light on the affinities of the type is concerned, by the plate published later in the *Flora Antarctica*. Kützing, in 1859 (*Tab. Phyc.* vol. ix. p. 32, tabs. 78 and 79), put a construction of his own on the genus, and figures *C. Decaisnei* and two other species, *C. filiformis* (= *Desmarestia filiformis* J. Ag.) and *C. Montagnei* (= *Nereia Montagnei* Derb. et Sol.), with it. His figure of *C. Decaisnei* is plainly adapted from the *Flora Antarctica*, and his opinion that it belonged to the *Sporochnaceæ* could hardly be maintained, though it will be seen later that his view is much nearer the mark than the original one. Harvey subsequently repudiated the Kützingian view in his *Index Generum Algarum*, p. 2, where he quotes under *Nereia* as a synonym, "*Cladothele* Kg. (non H. f. & H.)." He was, no doubt, right in maintaining that the *Cladothele* of Kützing is not the *Cladothele* of Hooker and Harvey, but nowhere else in the *Index* does he mention his own genus, either among the valid genera or the synonyms. J. G. Agardh (*Till. Alg. Syst.* viii. *Siphoneæ*, p. 47) mentions *Cladothele*, and says, "Mihi, tantum ex icone judicanti, genus a Siphoneis admodum diversum videtur." De Toni (*Sylloge*, vol. i. p. 498) records *Cladothele* in the position originally assigned to it, but under the heading of "Genus quod ad locum dubium."

To sum up the original description, we have here a generic type possessing a peripheral structure (described by Hooker and Harvey as recalling *Codium* so closely that these authors were

induced to place it "certainly" near that Siphoneous genus), and, together with it, a central axis of cells, like those of *Polysiphonia*. When this assignment of its systematic position was made, it should be remembered that our knowledge of the *Siphoneæ* (in the wide sense) was by no means what it has recently become through the researches of numerous phycologists, and it can hardly be doubted that such a position would not have suggested itself to a phycologist of the present day describing it for the first time. Small wonder, then, that of late years it has been left by authors among the genera of doubtful position. During recent work, in which I have endeavoured to give definite systematic positions to other genera of equivocal character in the same group, I have several times casually examined *Cladothele* with curiosity and misgiving. It always seemed plain in the light of our present knowledge that if the figures were fairly accurate, it had no business among *Siphoneæ*, however widely one might stretch the limits of that elastic group. In order to attempt a solution of the difficulty, I recently made a minute examination of the authentic specimens at the British Museum collected at the Falkland Islands during the voyage of the 'Erebus' and 'Terror.' After some trouble in preparing the specimens, which had shrunk somewhat in drying, the structure as described above became plain in the sections, though the figures of cells by Hooker and Harvey are not quite accurate—they are too diagrammatic. The peripheral cells, said to resemble those of *Codium*, though smaller in proportion, were always empty in the first sections examined. The sections drawn on the accompanying plate are of a thicker portion of the thallus than in the Hooker and Harvey figure, and the *Codium*-like appearance of the cells is absent, owing to full sporanges only, and not *empty* ones, being figured. After repeated sections of another portion had been made, I was rewarded by finding the contents present, and these contents at once proclaimed them sporanges of the type familiar to us in the *Phæophyceæ*. A further study of the sporanges, both in surface view and in section, caused me to refer to the figures of *Stictyosiphon tortilis*, fresh in memory from their recent publication by Prof. Reinke (*Atlas Deutscher Meeresalgen*, 1891, tabs. 31 and 32), and it was at once apparent that in *Cladothele Decaisnei* we have a form generically indistinguishable from *Stictyosiphon*, corresponding in the structure of the central axis and in the peripheral cells. A comparison of *Cladothele* with material of *Stictyosiphon* amply confirmed this view in all details. The plentiful empty sporanges had, as I have indicated, suggested to Hooker and Harvey the resemblance they noted to the peripheral cells of *Codium*. When examined in surface view, the full sporanges are seen to abound over large tracts of the thallus, occurring sometimes singly, but more often in irregular sori. A glance at Prof. Reinke's plate will show the faithfulness of the original description of the vegetative structure of *Cladothele*, so far as it goes, and if the imperfect knowledge of the green algæ, and even more of the obscure forms of *Phæophyceæ* which existed at the time, be taken into account, it will be under-

stood how easily such an error would be made, although it assigned to a place near *Codium* a brown alga such as *Stictyosiphon*—a genus described a few years before by Kützing. Though the appearance of the thallus as seen with the naked eye is a light greyish green, under the microscope the dirty green noted by the authors suited even in the dried specimens the colour to be expected in the *Phæophyceæ*.

I have spoken hitherto of sporanges simply, and at first I confess they seemed to me to be definitely unilocular, as described by Areschoug, Hauck, and Kjellman. Reinke points out (*loc. cit.*, p. 49), however, that this view of the sporanges of *Stictyosiphon tortilis* is a mistaken one, although he admits that the empty sporanges appear plainly to point to their being unilocular, since they show merely a single cavity. Wollny first pointed out (*Hedwigia*, 1886, iv. p. 130, tab. 2, fig. 1) that plurilocular sporanges occur in this genus, and that they possess an intrasporangial cell-wall net. Reinke himself affirms that he has examined hundreds of living specimens from different localities, and has come to the conclusion that, so far, only plurilocular sporanges are known in *Stictyosiphon tortilis*, and that they possess the structure described by Wollny.

It seems strange that on the escape of the spores they should leave no trace of this structure behind, since the empty sporanges have without doubt only a single chamber, but Reinke explains that the intrasporangial net is dissolved on the emission of the spores—a process which is certainly known to occur partially, at least in the plurilocular sporanges of other *Phæophyceæ*. Reinke recommends the placing of fresh specimens with ripe zoosporanges into weak glycerine, or, better still, a treatment with *eau de javelle*, in order to demonstrate this interesting structure. A detailed description of the structure and development of the sporanges will be found in Reinke's *Atlas* at the place cited.

Owing to the fact that the Falkland Island material has not been very well dried, there was some difficulty in obtaining a satisfactory view of the internal structure of the sporanges. After the employment of several methods, I succeeded at last in discovering the intrasporangial net clearly exhibited in *Stictyosiphon Decaisnei*, as I must now call this form. The successful method was, permitting the material to soak overnight in brine, then warming it in fresh water and adding spirit, and finally hardening in absolute alcohol.

As regards the vegetative structure, I have already mentioned its complete accordance with the generic character of *Stictyosiphon*. The thallus is described as being sometimes solid, and sometimes with a central intercellular space. I have met with examples of both in my sections of *Cladothele*, and in the original figures in the *Flora Antarctica* (tab. 190, fig. 5) both conditions are represented. The figures of longitudinal and transverse sections of the Falkland Islands material in the accompanying plate show the agreement in vegetative structure of this species with the generic type.

It only remains for me to add that the genus belongs to the *Punctarieæ*, and to furnish the following description of the species:—

Stictyosiphon Decaisnei mihi.—Radix fibrosa? Frondes 4–6 unc. altæ, cæspitosæ, filiformes, seta porcina crassiores, cylindraceæ, flexuosæ, plus minusve ramosæ, ramificatione valde irregulari. Rami primarii elongati, sæpe simplices, ramulis longis simplicibus, sæpissime secundis curvatis v. incurvis vix attenuatis laxe donati; zoosporangiis singulis aut binis aut pluribus in soris aggregatis.

Cladothele Decaisnei Hk. f. et Harv.

Explanation of Plate 306. — Fig. 1. *Stictyosiphon Decaisnei*, nat. size. 2. Longitudinal section of thallus, × 100. 3. Transverse section of thallus, with central intercellular space, × 100. 4. Transverse section of solid thallus, × 100. 5. Plurilocular sporange, × 250. 6. Surface view of thallus, with sporanges, × 75.

Note.—On completing the examination of this form, I mentioned the result casually in a letter to M. Bornet, and named *Stictyosiphon* as the genus in which I proposed to place *Cladothele*. He very kindly told me what had until then escaped my notice, that in the *Mission Scientifique du Cape Horn* (Botanique), Paris, 1889, p. 41, M. Hariot had mentioned briefly *Cladothele Decaisnei*, and had proposed to place it among the *Chordarieæ* near *Stereocladon*. On referring to this note, I find that M. Hariot, who had seen a specimen in Herb. Montagne, gives the genus this position. He gives no account of its structure, and does not say whether he has seen the sporanges; nor does he propose to merge the genus in *Stereocladon*, or another, but merely remarks that it needs further investigation. I am, however, rejoiced to find that in so weighty a matter as the transference of this type from the green Algæ to the brown I have the advantage of agreement on the part of so excellent an authority as M. Hariot.

KEY TO THE GENERA AND SPECIES OF BRITISH MOSSES.

By the Rev. H. G. Jameson.

(Concluded from p. 147.)

HETEROCLADIUM.

1 { St. ls. recurved; lid conic ..... *dimorphum*
  { St. ls. patent; lid rostrate ..... *heteropterum*

HYLOCOMIUM.

1 { St. not villous 2
  { St. thickly clothed w. branched green villi 4

2 { St. ls. cordate at base, v. spreading, not recurved ..... *triquetrum*
  { St. ls. widely ovate at base, not cordate, recurved 3

3 { Ls. recurved in all directions, sc. plic.; st. r. weak ..... *squarrosum*
  { Upper ls. m. or l. secund, plicate at base; pl. strong ..... *loreum*

4 { St. closely bi-, tri-pinnate; ls. imbric., glossy ..... *splendens*
  { Stem irregularly or distantly pinnate, usu. arched 5

5 { St. ls. large, oblong-ovate, closely imbric., usu. 1-nerved .....*Oakesii*
(St. ls. m. or l. triangular, not or loosely imbric., 2-nerved 6

6 { St. ls. decurrent at base, coarsely serr.; lid conic .....*umbratum*
(St. ls. w. rounded base, finely serrate; lid beaked.....*brevirostrum*

HYMENOSTOMUM.

1 { Ls. with plane margins.....2
(Ls. with involute margins 3

2 { Caps. alm. immersed; seta sc. ½ line long .....*rostellatum*
(Seta longer; ls. squarrose; st. decumbent below.....*squarrosum*

3 { Pl. slightly branched; ls. narrow, twisted when dry ...*microstomum*
(Pl. much branched; ls. dense, wider, incurved when dry .....*tortile*

HYPNUM.

1 { Ls. acute or acuminate 2
(Ls. m. or l. obtuse or apiculate.....33

2 { Nerve single (occasionally forked at the end) 3
(Ls. nerveless, or shortly 2-nerved.....20

3 { Ls. transversely rugose; plant robust .....*rugosum*
(Ls. not transversely rugose 4

4 { Ls. not plicate when moist (or faintly striate only).....5
(Ls. distinctly plicate when moist 15

5 { Ls. squarrose or v. spreading (sometimes also subsecund).....6
(Ls. distinctly secund 8

6 { St. ls. ovate-acuminate; n. ceasing about half-way ...*chrysophyllum*
(Ls. lanceolate-acumin.; n. longer; growing in wet places 7

7 { Ls. with v. narrow points; n. almost to apex; pl. slender .....*elodes*
(Ls. with shorter acumen; nerve ceasing below apex .....*polygamum*

8 { Stem tomentose; nerve thick, usu. to apex .....*filicinum*
(Stem not tomentose; nerve not reaching apex.....9

9 { Ls. soft and flaccid, w. short, usu. bluntish acumen; plant growing on rocks, &c., in streams 43
(Ls. w. long, fine-pointed acumen 10

10 { Ls. not (or scarcely auricled).....11
(Ls. w. angular cells enlarged, m. or l. distinctly auricled 12

11 { Monoicous; subpinnate; ls. crowded, circinate .....*revolvens*
(Dioicous; robust, pinnate; ls. wider, falcato-secund .....*Cossoni*

12 { Angular cells incrassate, yellowish; pl. robust.....*Sendtneri*
(Auricles hyaline; plant usu. less robust 13

13 { Annulus absent; cells v. narrow; n. almost reaching apex.....14
(Annulus wide; dioicous; ls. secund, n. shorter .....*aduncum*

14 { Dioicous; ls. faintly striate, falcato-secund .....*exannulatum*
(Monoicous; st. ls. flexuose, only the upper ones secund .....*fluitans*

15 { Stem w. numerous paraphyllia, w. or without radicles 16
(Stem without paraphyllia or radicles 18

16 { St. v. radiculose; st. ls. deltoid, bi-auriculate.....*commutatum*
(Stem not or sc. radiculose; st. ls. ovate at base.....17

17 { Pl. robust; n. thick, alm. to apex; ls. m. or l. falcate .....*falcatum*
(Pl. weak; nerve slender, usu. about half-way; ls. hamulose...*sulcatum*

18 { Brs. swollen w. the broad, v. concave, entire ls. .....*lycopodioides*
(Ls. narrower; plant not turgid; stem usu. hooked above 19

19 { Ls. v. narrow, especially at apex, serrulate, circinate .....*uncinatum*
(Ls. wider at apex, sc. serrulate, purple along base .....*vernicosum*

20 { Ls. v. widely ovate or suborbicular, soft, w. short points.....43
(Ls. ovate or lanceolate, with long, tapering points.....21

21 { Ls. squarrose or very widely spreading 22
Ls. distinctly secund 24

22 { Ls. sharply serrulate, all strongly recurved .....*Halleri*
Ls. almost entire, scarcely or irregularly recurved 23

23 { St. creeping, slender; angular cells small, quadrate .....*Somerfelti*
St. erect, tufted; cells v. narrow, dilated at angles .....*stellatum*

24 { St. rigid; brs. pectinate; ls. deeply plicate .....*crista-castrensis*
Ls. not or only slightly plicate when moist 25

25 { St. ls. from wide cordate base, serrul. throughout .....*molluscum*
Ls. ovate-lanc., entire, or serrul. in upper part only.....26

26 { Ls. not at all auricled.....*hamulosum*
Ls. w. angular cells forming m. or l. distinct auricles 27

27 { Angular cells swollen, hyaline 28
Angular cells m. or l. thickened or coloured 29

28 { Ls. r. soft, w. wide acumen; stem little branched .....*Patientiæ*
Ls. w. very long, fine acumen; stem pinnate .....*callichroum*

29 { Ls. secund, sc. falcate, usu. turned upwards, narrow, tapering 30
Ls. falcate- or circinate-secund, usu. wider at base 31

30 { Capsule horizontal; cells rhomboid; brs. incurved .....*incurvatum*
Capsule erect; cells linear .....*resupinatum*

31 { Brs. few, fastigiate; tufts green, fuscous within .....*Bambergeri*
Stem m. or l. pinnate; pl. usu. dull green or brownish 32

32 { Ls. serrul., red-brown where they join the brown stem .....*imponens*
Ls. often entire, not red at base; st. paler .....* *cupressiforme*

33 { Ls. minute, alm. orbicular, serrul.; n. absent or double.....*micans*
Ls. larger, entire or subentire 34

34 { Ls. firm, patent or imbric.; pl. usu. in bogs or on the ground 35
Ls. soft, flaccid, usu. secund; pl. on rocks, &c., in streams.....42

35 { Ls. singly nerved half-way or more 36
Ls. nerveless or shortly 2-nerved 41

36 { Stem pinnate; ls. v. concave, apiculate, pale green .....*purum*
Stem rarely pinnate; ls. obtuse, or reddish and apiculate 37

37 { Ls. imbricate when dry; stem almost simple.....38
Ls. spreading or loosely imbricate; st. m. or l. branched 39

38 { Ls. roundish, v. obtuse, brownish, auricles sc. marked .....*trifarium*
Ls. oblong, yellowish, auricles distinct; pl. slender .....*stramineum*

39 { St. ls. wide, cordate-ovate, obtuse; plant usu. green 40
Ls. m. or l. oblong, usu. apiculate; older ls. red .....*sarmentosum*

40 { Brs. few; cells gradually larger towards base of ls.....*cordifolium*
St. w. many short brs.; ls. w. marked swollen auricles.....*giganteum*

41 { St. red; brs. obtuse at ends; auricles yellowish .....*Schreberi*
St. green (exc. when young); brs. cuspid.; auric. hyaline...*cuspidatum*

42 { Ls. large, roundish, swollen on one side; n. none or 2.....*scorpioides*
Ls. not ventricose, shortly 2-nerved, or 1-nerved half-way 43

43 { Ls. wide-ovate or roundish, apex usu. rounded or apiculate 44
Ls. ovate-lanceolate, m. or l. tapering towards apex.....46

44 { Ls. about ½ line long, roundish, entire; cells r. short .....*arcticum*
Ls. about 1 line, often subserrul. at apex; cells long.....45

45 { Ls. spreading, widely ovate, m. or l. tapering .....*molle*
Ls. orbicular, obtuse or shortly apiculate, firmer.....*dilatatum*

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* *H. canariense*, from Killarney, is described as slender, with more serrulate leaves, wider cells, and very short capsule.

46 { Angular cells large, thin, hyaline; dioicous.....*ochraceum*
Angular cells small, m. or l. obscure or coloured; monoicous 47

47 { Angular cells obscure; n. often single; annulus absent.....*palustre*
Ang. cells distinct, orange; n. faint, double; annul. wide...*eugyrium*

LESKEA.

1 { Ls. ovate-lanceolate, acute, n. ceasing below apex .....*polycarpa*
Ls. from ovate base, narrowly acumin., n. strong to apex.....*nervosa*

MNIUM.

1 { Leaf-margin entire 2
Leaves with toothed margin 4

2 { Marginal cells distinct, long and narrow, in 1 or more layers 3
All cells r. elongate, marginal sc. distinct .....*cinclidioides*

3 { Margin of 2—4 layers; ls. usu. apicul.; caps. oval .....*punctatum*
Margin of 1 layer; ls. obtuse; caps. roundish .....*subglobosum*

4 { Margin not bordered, serrate .....*stellare*
Ls. with thickened border 5

5 { Border simply serrate (the teeth single, in one rank).....6
Border doubly dentate (the teeth in a double rank) 9

6 { St. 1—3 in.; ls. serr. to base; lid conic; dioicous 7
St. ½—1 in.; ls. serr. in upper half only; synoicous 8

7 { Ls. ligul., obtuse, undul.; cells angular-rotund.....*undulatum*
Ls. ovate, acute; cells irregularly oblong .....*affine*

8 { Ls. acute, ovate or oblong; lid conic .....*cuspidatum*
Ls. obtuse, apiculate, obovate; lid rostrate .....*rostratum*

9 { Ls. lanc., slightly decurrent on stem; lid mamillate .....*hornum*
Ls. wider, w. long decurrent wings; lid conic, rostrate 10

10 { Pl. robust; ls. 2—3 lines long; nerve excurrent .....*spinosum*
St. ½—1 in.; ls. 1½ line or less; n. ceasing in apex 11

11 { Cells rounded at the corners, about 25 μ in diameter 12
Cells hexagonal, smaller, about 12—15 μ; dioicous..*orthorrhynchum*

12 { Synoicous; ls. obovate-lanc., serration often weak .....*serratum*
Dioicous; ls. broadly elliptic.....*riparium*

MYURELLA.

1 { Ls. closely imbric., obtuse or v. shortly apiculate .....*julacea*
Ls. spreading, more distant, usu. w. longish apiculus.....*apiculata*

NECKERA.

1 { Ls. not undulated (cf. *Homalia trichomanoides*).....*complanata*
Ls. m. or l. undulated transversely 2

2 { Caps. immersed; ls. sc. undulate when moist.....*pennata*
Caps. exserted; ls. undulate wet or dry.....3

3 { Pl. small; ls. under 1 line long, usu. m. or l. acuminate.....*pumila*
Pl. robust; ls. 1—2 lines long, r. obtusely pointed.....*crispa*

ORTHOTHECIUM.

1 { Pl. v. small; ls. subsecund, sc. striated .....*intricatum*
Pl. larger; ls. imbricate, strongly plicate .....*rufescens*

ORTHOTRICHUM.

1 { Ls. obtuse or minutely apiculate.....2
Ls. more or less acute or subacute 4

2 { Ls. ovate, v. papillose, with erect margin .....*obtusifolium*
Ls. faintly papillose, margin revolute in lower half.....3

3 { Ls. oblong-lingulate, usu. obtuse, cells about 8 μ .....*rivulare*
Ls. obovate, upper ones apiculate, cells about 16 μ.....*Sprucei*

4 { Ls. long, w. brown clavate gemmæ on surface, v. papillose ...*Lyellii*
  { Ls. shorter, without appendages.....5

5 { Ls. tapering to serrulate hyaline points .....*diaphanum*
  { Ls. without hyaline points 6

6 { Caps. smooth, without bands or striæ .....*leiocarpum*
  { Capsule striated 7

7 { Caps. exserted, stomata immersed below cuticular cells.....8
  { Caps. immersed (or emergent w. superficial stomata) 10

8 { Perist. double, t. reflexed when dry; ls. r. crisped .....*pulchellum*
  { Perist. usu. single, teeth erect when dry; ls. not crisped 9

9 { Caps. subcylindric, 16-striate; perist. t. 16 .....*anomalum*
  { Caps. cylindric, usu. 8-striate; t. often united in 8.....*saxatile*

10 { Caps. 16-striate; perist. single (stomata immersed) .....*cupulatum*
   { Caps. 8-striate; perist. usu. double (exc. *Shawii*) 11

11 { Perist. t. erect when dry (stom. superfic.); on rocks and walls 12
   { Perist. t. reflexed when dry; on trees, or sometimes on rocks 13

12 { Caps. tapering at base; ls. usu. of single layer .....*rupestre*
   { Caps. rounded at base; ls. of double layer of cells .....*Sturmii*

13 { Perist. t. opaque w. dense papillæ; stomata superfic. 14
   { Perist. t. yellowish, v. finely papillose; stomata immersed.....17

14 { Perist. single; caps. v. faintly striate below mouth only .....*Shawii*
   { Perist. double; caps. distinctly striate.....15

15 { Caps. m. or l. emergent, striate in upper half .....*speciosum*
   { Caps. immersed, strongly striate in whole length 16

16 { Ls. patulous, coarsely papillose, cells rounded .....*affine*
   { Ls. shorter, sc. papillose, cells hexagonal; pl. denser .....*fastigiatum*

17 { Vaginula very hairy.....18
   { Vaginula naked.....19

18 { Striæ of caps. strong, of 4 rows of cells .....*stramineum*
   { Striæ of caps. faint, of 2 rows only .....*patens*

19 { Caps. short, sharply contracted to the pedicel.....*fallax*
   { Caps. elongate, gradually tapering to the pedicel 20

20 { Caps. subcylindric; calyptra conic, with few hairs .....*tenellum*
   { Caps. oval-oblong; calyptra campanulate, naked.....*pallens*

PHASCUM.

1 { Caps. immersed .....*cuspidatum*
  { Caps. exserted.....2

2 { Seta arcuate; caps. roundish-ovate, without lid .....*curvicollum*
  { Seta straight; caps. with a minute, persistent lid 3

3 { Caps. subglobose; calyptra rough at apex .....*rectum*
  { Caps. elliptic, acuminate; calyptra smooth.....*bryoides*

PHILONOTIS.

1 { Stem $\frac{1}{4}$—$\frac{1}{2}$ in.; inner perist. sometimes imperfect.....*rigida*
  { Stem over 1 in. 2

2 { Ls. w. plane margins, ovate-lanc., tapering, cells large.....*calcarea*
  { Margin m. or l. reflexed, cells smaller above 3

3 { Ls. wide-ovate, incurved at apex, usu. obtuse or cucull. .....*adpressa*
  { Ls. ovate or ovate-lanc., acute or acuminate 4

4 { Ls. spirally arranged on stem, cells small, r. obscure .....*seriata*
  { Ls. adpressed, secund, or spreading, cells larger below .....*fontana*

PHYSCOMITRIUM.

1 { Ls. serrate above; caps. w. distinct neck .....*pyriforme*
  { Ls. alm. entire; caps. without neck, wide-mouthed .....*sphæricum*

PLAGIOTHECIUM.

1 { Ls. sc. or shortly acuminate, v. complanate, subentire 2
  { Ls. w. tapering acumen, smaller, often less regularly complan. 4

2 { Ls. transversely undulate, pale, bluntish; pl. robust .....*undulatum*
  { Ls. not undulate.....3

3 { Ls. pale green, glossy when dry; lid conic.....*denticulatum*
  { Ls. darker, opaque when dry; lid w. long beak.....*sylvaticum*

4 { Ls. decurrent on the stem.....5
  { Ls. not decurrent 6

5 { Pl. v. small; ls. laxly complan., entire; caps. smooth .....*latebricola*
  { Ls. usu. secund, w. serrul. acumen; caps. striated .....*Mühlenbeckii*

6 { Ls. secund, pointing upwards, w. long, serrul. acumen.....*silesiacum*
  { Ls. not curved upwards, complan. or complanate-secund 7

7 { Ls. ovate-lanc., complan., glossy, w. toothed points; dioicous 8
  { Ls. narrower, laxly complan., entire; monoicous 9

8 { Ls. contracted to narrow, distantly toothed acumen.....*Borrerianum*
  { Ls. acute, sc. acumin., finely serrul. above .....*Rhyncost. depressum*

9 { Ls. m. or l. secund, often falcate; caps. suberect .....*pulchellum*
  { Ls. rarely subsecund, more shining; caps. cernuous .....*nitidulum*

PLEURIDIUM.

1 { Perich. ls. similar to others; n. narrow; cells r. lax .....*nitidum*
  { Perich. ls. much longer than others; n. strong; cells small.....2

2 { Per. ls. lanceol.-subul., w. antheridia naked in axils .....*subulatum*
  { Perich. ls. from a broader base, suddenly subulate-setaceous; barren flower gemmiform, axillary .....*alternifolium*

POGONATUM.

1 { St. short; ls. broadly lanc., dull green, subinvolute at margin.....2
  { St. longer, usu. branched; ls. narrow-lanc., acute, rigid 3

2 { Ls. obtusely toothed; caps. subglobose; columella cylindric ...*nanum*
  { Ls. sharply serr.; caps. cylindric; columella 4-winged .....*aloides*

3 { Caps. subcylindric, erect; ls. usu. reddish-brown below ...*urnigerum*
  { Caps. oblong, tumid, inclined; st. usu. much branched .....*alpinum*

POLYTRICHUM.

1 { Ls. entire, margin inflexed 2
  { Ls. sharply serrate, acuminate, margin plane 5

2 { Ls. m. or l. obtuse at apex, lamellæ high .....*sexangulare*
  { Ls. aristate at apex, lamellæ lower.....3

3 { Arista short, coloured 4
  { Arista longer, hyaline, rough; stem short.....*piliferum*

4 { Stem not tomentose; ls. spreading, recurved .....*juniperinum*
  { St. tall, w. dense tomentum; ls. erecto-patent, straight .....*strictum*

5 { Ls. w. wide pellucid wings; caps. obscurely angled .....*gracile*
  { Ls. longer, w. v. narrow margins; caps. distinctly angled.....6

6 { Caps. oblong; no distinct perich. ls.; lamellæ entire .....*formosum*
  { Caps. cubic; perich. ls. long, membranous; lamellæ grooved...*commune*

POTTIA.

1 { Peristome absent, or rudimentary 2
  { Peristome present.....11

2 { Nerve w. lamellæ; caps. oval on short seta .....*pusilla*
  { Nerve without lamellæ 3

3 { Ls. serrul. at apex, nerve usu. vanishing ..... *Heimii*
  { Ls. entire, nerve excurrent 4

4 { Lid conic, obtuse or apiculate; ls. ovate-lanceolate ..... *minutula*
  { Lid m. or l. beaked; ls. oblong or obovate 5

5 { Ls. quite smooth (calyptra smooth) 6
  { Ls. m. or l. papillose 7

6 { Caps. short, turbinate; leaf-cells thin-walled ..... *truncata*
  { Caps. oval; leaf-cells more incrassate ..... *littoralis*

7 { Cal. scabrous above; n. excurrent in a long point 8
  { Cal. smooth; n. excurr. in a short point (exc. *crinita*) 9

8 { Caps. oval; leaf-cells r. lax ..... *asperula*
  { Caps. long-elliptic; upper cells small (12—16 μ) ..... *Wilsoni*

9 { Nerve excurrent in a longish hair-point ..... *crinita*
  { Nerve excurrent in a short point 10

10 { Ls. oblong, in 5 ranks; perist. rudimentary ..... *intermedia*
   { Ls. obovate-spathul., in 8 ranks, v. green; per. absent ..... *viridifolia*

11 { Nerve excurrent; ls. m. or l. papillose 12
   { N. vanishing, ls. smooth, v. broad, in a bulb-like tuft ..... *latifolia*

12 { Calyptra smooth; lid rostrate 13
   { Cal. scabrous above; lid conic ..... *Starkeana*

13 { Leaf-margin recurved, n. excurrent in longish point ..... *lanceolata*
   { Margin plane, n. excurr. in short mucro ..... *cæspitosa*

PSEUDOLESKEA.

1 { Ls. ovate-lanc., usu. denticul. at apex, n. alm. to apex ..... *atrovirens*
  { Ls. entire, dark green, n. $\frac{1}{2}$ or $\frac{2}{3}$ length of leaf ..... *catenulata*

RACOMITRIUM.

1 { Ls. without diaphanous points 2
  { Upper ls. with diaphanous points 7

2 { Nerve 2-winged at back above; seta arcuate ..... *patens*
  { Nerve not winged; seta erect 3

3 { Ls. papillose; upper cells long; st. w. many short brs. ... *fasciculare*
  { Ls. smooth; upper cells short; brs. mostly dichotomous 4

4 { Caps. round-ovate, hard; ls. bistratose above ..... *ellipticum*
  { Caps. longer; ls. of 1 layer of cells 5

5 { Ls. oblong, v. obtuse, n. not reaching the usu. toothed apex ... *aciculare*
  { Ls. narrower, entire, more tapering 6

6 { Tall, loosely matted; n. strong, ceasing in apex ..... *protensum*
  { Small, dense tufts; ls. smaller, n. vanishing... [var. of *heterostichum*]

7 { Ls. with simply denticulate hyaline points 8
  { Ls. with eroso-serrate hyaline points 10

8 { Brs. fastigiate; caps. v. small, on short seta ..... *sudeticum*
  { Brs. fasciculate; caps. and seta longer; basal cells narrower 9

9 { Upper cells of ls. short, hair (in type) long ..... *heterostichum*
  { Upper cells long and sinuous (a doubtful native) ..... *microcarpon*

10 { Ls. v. papillose, n. ceasing above middle; seta smooth ..... *canescens*
   { Ls. smooth (exc. points); n. reaching apex; seta rough... *lanuginosum*

RHABDOWEISSIA.

1 { Ls. acute, alm. entire; perist. t. short, subul., fugaceous ..... *fugax*
  { Ls. r. obtuse, toothed above; perist. t. longer, lanceolate 2

2 { Plant small; ls. narrow, cells 8—10 μ wide ..... *denticulata*
  { Pl. $\frac{1}{2}$—1 in.; ls. broader, coarser toothed, cells 14 μ ..... *crenulata*

RHYNCOSTEGIUM.*

1 { Ls. nerveless, or shortly and faintly 2-nerved 2
  { Ls. singly nerved half-way or more 3

2 { Ls. usu. complan., finely serrul., not auricled .....*depressum*
  { Ls. subsecund, entire, w. one or more swollen angul. cells...*demissum*

3 { Ls. narrow-lanceolate 4
  { Ls. ovate (all w. smooth seta) 5

4 { Ls. alm. setaceous, silky, n. alm. to apex; seta smooth .....*tenellum*
  { Ls. clustered at ends of brs., acute, n. short; seta rough...*curvisetum*

5 { N. strong alm. to apex; ls. firm; pl. aquatic .....*rusciforme*
  { N. thin, usu. about ⅔ length of leaf; plant terrestrial.....6

6 { Ls. wide, v. twisted when dry, cells 12 μ wide.....*rotundifolium*
  { Ls. less widely ovate, sc. twisted, cells 5 or 6 μ wide.....7

7 { Ls. v. concave, imbric., obtuse or v. shortly pointed .....*murale*
  { Ls. only slightly concave, acuminate 8

8 { St. about 1 in., rooting; on walls, trees, &c.....*confertum*
  { St. ½—3 in., not rooting; growing on the ground .....*megapolitanum*

SCLEROPODIUM.

1 { Ls. ovate-oblong, apicul.; brs. rounded, obtuse, incurved...*illecebrum*
  { Ls. ovate-lanceolate, acute; brs. slender.....*cæspitosum*

SELIGERIA.

1 { Perist. absent.....*Doniana*
  { Peristome present 2

2 { Seta arcuate when moist; caps. oval or oblong .....*recurvata*
  { Seta straight when moist 3

3 { Caps. elliptic, w. small mouth, subcernuous; ls. acute .....*subcernua*
  { Caps. short, erect, turbinate when dry and empty 4

4 { Ls. short, r. obtuse; seta thick .....*calcarea*
  { Ls. longer, lanceolate-subulate; seta slender 5

5 { Seta v. short; caps. sc. exserted; ls. v. acute .....(var. of) *acutifolia*
  { Seta longer; ls. not reaching to base of capsule 6

6 { Ls. lanc., w. short obtuse subula, exactly 3-ranked .....*tristicha*
  { Ls. narrow, lanceolate-setaceous, acute .....*pusilla*

SPHÆRANGIUM.

1 { Perich. ls. 2, convolute, not keeled; pedicel straight .....*muticum*
  { Perich. ls. 3, connivent, keeled; pedicel cygneous.....*triquetrum*

† SPHAGNUM. (N.B.—In this genus, "c. c." stands for the chlorophyllose cells, and "h. c." for the hyaline cells, of the branch-leaves.)

1 { Br. ls. broad, cucull., scaly at back of apex; st. cuticle fibrous.....2
  { Br. ls. not scaly at apex, rarely cucull.; cuticle not fibrous 4

2 { Pl. green or purple; c. c. enclosed, w. smooth walls .....*cymbifolium*
  { Pl. ochraceous, espec. apices of br. ls.; c. c. w. papillose walls.....3

3 { Papillæ v. small; c. c. lenticular, enclosed .....*papillosum*
  { Papillæ longer; c. c. triangular, emerging in front .....*Austini*

4 { Br. ls. oblong or ovate, w. short, bluntish apices 5
  { Br. ls. ovate-lanc., w. elongated, tapering apices.....9

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* The species of *Eurhynchium* may generally be distinguished by having either more or less plicate leaves, or a suberect capsule, or a rough seta, neither of which occur in *Rhyncostegium* (exc. *curvisetum*; see under *Eurhynchium*).

† In cases of difficulty, the student may find assistance by following the arrangement adopted by Mr. John Sim; see *Scottish Naturalist*, vol. iv., p. 172.

5 { St. ls. v. large, not or sc. bordered, 3-toothed at apex.....*molle*
St. ls. distinctly bordered, not toothed (exc. *tenellum*) 6

6 { St. ls. v. short, rounded; br. ls. ovate-oblong, v. obtuse .....*rigidum*
St. ls. longer; br. ls. ovate, usu. subsecund 7

7 { St. ls. toothed at apex; h. c. of br. ls. short and wide; retort-cells of brs. v. large, recurved at tips .....*tenellum*
St. ls. not toothed; h. c. narrow; retort-cells smaller 8

8 { Cuticle of st. in a single layer; h. c. very porous .....*subsecundum*
Cuticle in 2 or 3 layers; h. c. with fewer pores .....*laricinum*

9 { St. ls. narrower at the base than at the fringed apex 10
St. ls. not narrower at base than at apex 11

10 { St. ls. v. obtuse, fringed all round summit; pl. pale.....*fimbriatum*
St. ls. fringed only at the truncated apex.....*Lindbergii*

11 { St. ls. not or scarcely bordered 12
St. ls. broadly bordered below with narrow cells 14

12 { St, ls. 3-toothed at apex; br. ls. r. bluntly pointed .....*molle*
St. ls. fringed at apex; br. ls. acuminate, m. or l. squarrose 13

13 { Stem-cuticle of 2 layers; br. ls. recurved from middle.....*squarrosum*
Cuticle usu. 3 or 4 layers; br. ls. recurved at apex only .....*teres*

14 { Br. ls. flattened and undul. at borders when dry, pores small.....15
Br. ls. concave and not undul. when dry, pores r. large 16

15 { Pendent brs. concealing the stem; st. ls. not fibrillose ...*intermedium*
Pendent brs. 0 or few; st. ls. usu. fibrillose above .....*cuspidatum*

16 { St. ls. broadly truncate and fringed; pl. yellowish.....*strictum*
St. ls. m. or l. pointed, usu. toothed; pl. often reddish 17

17 { Monoicous; st. ls. usu. w. fibres; br. ls. narrow-lanc.....*acutifolium*
Dioicous; st. ls. rarely w. fibres; br. ls. alm. elliptic .....*rubellum*

SPLACHNUM.

1 { Ls. roundish, entire, obtuse; apophysis globose, v. large...*vasculosum*
Ls. acute, w. longish acumen, often toothed.....2

2 { Apophysis roundish-ovate, little wider than caps. .. ..*sphæricum*
Apophysis large, pyriform, tapering below .....*ampullaceum*

SYSTEGIUM.

1 { Upper ls. lanceolate-subul., margin involute above.....*crispum*
Upper ls. lanceolate-acute, margin plane 2

2 { Perich. ls. long, erect; ls. crisped when dry .....*multicapsulare*
Perich. ls. few, short, divergent; ls. sc. crisped .....*Mittenii*

TETRAPLODON.

1 { Ls. toothed above; seta sc. longer than ls., pale .....*angustatus*
Ls. entire; seta longish, red .....*mnioides*

THUIDIUM.

1 { Stem bi- or tri-pinnate 2
Stem simply pinnate 3

2 { Bipinnate; apical cell of br. ls. crowned w. papillæ .....*recognitum*
Tripinnate; apical cell acute; perich. ls. ciliate .....*tamariscinum*

3 { St. ls. subsquarrose, auricled w. large swollen cells .....*decipiens*
St. ls. not auricled 4

4 { Stem rigid; ls. papillose on keel; cells shortly oval .....*abietinum*
Stem flexible; ls. smooth on keel; cells elongated .....*Blandovii*

TIMMIA.

1 { Ls. spreading, of one length; n. smooth on inner face .....*austriaca*
Ls. erect, upper ones longer; n. papillose on inner face.....*norvegica*

TRICHOSTOMUM (*see* DIDYMODON).

ULOTA.

1 { Ls. imbricate and rigid when dry, r. short.....*Hutchinsiæ*
  { Ls. m. or l. crisped when dry, long-lanceolate 2

2 { Upper ls. tipped w. gemmæ; without dilated base .....*phyllantha*
  { Ls. not gemmiferous at tip, usu. dilated at base 3

3 { Caps. smooth below, plic. and v. contracted at mouth.....*Ludwigii*
  { Caps. striate in whole length, less, or not contracted 4

4 { St. creeping; perist. usu. single; ls. little crisped.....*Drummondii*
  { St. not creeping; perist. double; ls. much crisped when dry 5

5 { Caps. contracted at mouth when dry, much exserted.....*Bruchii*
  { Caps. not contracted at the mouth itself 6

6 { Calyptra w. few hairs; ls. w. submarginal band of v. narrow cells in lower half .....*calvescens*
  { Calyptra v. hairy; ls. without such a band 7

7 { Caps. contracted just below mouth when dry .....*crispa*
  { Caps. not or sc. contracted, less tapering at neck 8

8 { Caps. at least twice as long as it is wide .....*intermedia*
  { Caps. not much longer than it is wide; pl. small .....*crispula*

WEBERA.

1 { Ls. wide-ovate, bordered, entire, n. not nearly to apex .....*Tozeri*
  { Ls. not (or sc.) bordered, n. usu. longer.....2

2 { Ls. v. decurrent, lower ones obtuse; tufts red within.....*Ludwigii*
  { Ls. not or sc. decurrent; tufts not red, exc. the stems 3

3 { Comal ls. much elongate; caps. clavate or oblong; processes of inner perist. not or sc. cleft at keel.....4
  { Comal ls. less elong.; caps. shorter; processes widely cleft 7

4 { Synoicous or dioicous; ls. v. shining; caps. oblong .....*cruda*
  { Monoicous; caps. narrow, usu. w. long neck 5

5 { Male flower gemmiform, terminal on a branch .....*acuminata*
  { Antheridia naked, in axils of comal ls. 6

6 { Caps. w. neck as long as sporange; cilia usu. present .....*elongata*
  { Neck shorter than sporange; cilia 0 or rudimentary .....*polymorpha*

7 { Caps. v. short, exannulate; leaf-cells over 15 μ wide 8
  { Caps. longer (exc. *pulchella*), annulate; cells under 15 μ wide.....9

8 { Ls. glaucous-green; st. red; perist. t. orange or brown.....*albicans*
  { Ls. green; stem usu. pale; perist. t. red.....*carnea*

9 { Caps· shortly obovate (pl. v. small, similar to *carnea*).....*pulchella*
  { Caps. longer, m. or l. pyriform 10

10 { Dioicous; upper ls. nerved to apex, often mixed w. gemmæ...*annotina*
   { Monoicous, antheridia axillary; n. usu. ceasing below apex 11

11 { Ls. lanceolate, acute, serrate above .....*nutans*
   { Ls. ovate-lanc., subacute or obtuse, alm. entire .....*cucullata*

WEISSIA.

1 { Leaf-margin involute above middle .....*viridula*
  { Margin plane.....*mucronata*

ZIERIA.

1 { Ls. widely ovate, v. imbric., margin plane, n. not excurrent...*julacea*
  { Ls. lanc., less imbric., margin recurved, n. excurrent .....*demissa*

ZYGODON.

1 { Tall; ls. recurved, irregularly toothed at apex .....*Nowellii*
  { Shorter, usu. under 1 in.; ls. entire 2

2 { Nerve excurrent in a mucro; perist. absent.....*Stirtoni*
  { Nerve vanishing below apex.....3

3 { Ls. spreading, recurved; perist. (usu.) absent .....*viridissimus*
  { Ls. patent, not recurved; perist. double.....4

4 { Ls. lanc.; tufts loose, w. red radicles; dioicous .....*conoideus*
  { Ls. soft, subspathulate, cells laxer, rectangular and hyaline at base; pl. w. pale radicles; autoicous .....*Forsteri*

THE BOTANY OF THE SNARES.

By T. Kirk, F.L.S.

The Snares comprise several rocky islands situate on the 48th parallel of south latitude and about 65 miles in a south-westerly direction from the extreme southern point of Stewart Island. Owing to their being outside the direct track of vessels they are but rarely visited, so that hitherto nothing has been known of their fauna or flora. My visit was restricted to a few hours in January, 1890, when I was able to land on the largest island, which is of irregular outline and about a mile and a half in its greatest diameter. The cliffs are steep and lofty, but a good boat harbour exists on the north-east side. The rocks are granitic, and the greatest altitude does not exceed 480 feet. The rocks are everywhere covered with a deep layer of peat.

There is but little fresh water on the island; two small rills issuing from swampy ground unite before reaching the cliffs, but the water is undrinkable, being polluted by the penguins; and the few swamp-plants that occur exist under difficulties, being continually flattened under the broad feet of these birds, which abound everywhere, their numbers being but little reduced by the predaceous sea-hawks, which swoop down upon unguarded eggs or young birds, and are almost ready to attack man himself.

The crested penguins (*Eudyptes pachyrhynchus*) exercise an injurious effect upon large portions of the woody vegetation; they select sheltered places with an open aspect, where they perch upon the trees in vast numbers, forming large "rookeries"; the trees thus honoured by their presence are soon killed by their pungent ordure. Various petrels—the "mutton-birds" of the Maoris—form their burrows amongst the roots of the trees, and may be heard mewing and puling in all directions. Several interesting land birds inhabit the island, the more noticeable being the Auckland Island snipe (*Gallinago Aucklandica*); the grass bird (*Sphæneacus fulvus*), although now rare on the mainland, was frequent on this little island, and associated with a small robin (*Miro Traversii*) only known elsewhere on the Chatham Islands. The occurrence of birds with such weak power of flight on these lonely islands is very suggestive.

The true fur-seal was formerly plentiful on the Snares, but has almost become extirpated through the continuous visits of sealers,

who have unintentionally introduced a few plants from the mainland.

The greater portion of the island is covered with light and occasionally open bush, which never exceeds thirty feet in height. In a few places a dense scrubby growth of *Veronica elliptica*, five to eight feet high, requires some exertion to force one's way through, the difficulty being aggravated by the penguins, which make vicious snaps at the legs, while the explorer is held fast by entangled branches above. Usually a belt of open land covered with tussock occurs between the bush and the margin of the cliff, and a few small open patches occur also in the central parts of the island. In places where patches of bush have been felled by sealers the ground is covered with a dense growth of *Veronica elliptica* intermixed with tussock.

Approaching the island on a fine morning in January, the attention is at once arrested by the peculiar grey or whitish hue of the foliage, flecked here and there with green on the lower margin of the bush. On landing this is found to arise from the abundance of *Olearia Lyallii*, which is the principal tree on the island, and forms the greater portion of the arboreal vegetation. When growing in level situations of an open character it is a noble erect tree, with rather open spreading branches; but when growing on sloping hill sides exposed to the wind it is often inclined, or with a prostrate trunk, the roots, partly from the burrowing of the petrels, being torn out; of the soil the branches rooting at their tips give rise to new trunks, which in their turn are brought to the ground and repeat the process. The short trunks are sometimes three feet in diameter, but the majority were from one to two feet, the extreme height of the tree rarely exceeding twenty-eight feet.

The mature leaves of this fine tree are excessively rigid and coriaceous, with a very short, almost sheathing, petiole orbicular-ovate or broadly ovate, and abruptly acuminate, from three to seven inches in length, white, with appressed tomentum on *both* surfaces, although that on the upper surface usually disappears during the first winter. The flower-heads are produced in terminal racemes from three to eight inches in length, and are rayless; the rachis, peduncles, bracts, and outer involucral leaves are clothed with close snow-white tomentum, which forms a striking contrast with the almost black discoid heads, mostly composed of perfect florets. The involucral leaves are arranged in from five to eight series.

Although this fine plant differs widely in its general appearance from *O. Colensoi*, it is difficult to point out good distinctive characters. It diverges chiefly in the more open habit, stouter branches, broader leaves with the pubescence partially persistent above, and especially in the involucral leaves being arranged in from five to eight series; the last character alone being of any importance. The cultivator, however, will always consider it distinct. It is restricted to the Snares and to the Auckland Islands.

The patches of green amongst the white masses of the *Olearia* were caused by another grand plant, *Senecio Muelleri* T. Kirk,* a

* *Transactions of New Zealand Institute*, xv. 359.

noble species originally described from specimens collected on Herekopere Island, but the specimens in the original habitat are not nearly so large as those on the Snares, where it attains the extreme height of twenty-six feet, with a short trunk two feet in diameter. The branches are somewhat naked, so that the tree presents a straggling appearance, but the handsome foliage and large terminal panicles of yellow flowers, place it amongst the finest members of a large genus abounding in grand species.

Veronica elliptica, which has been already mentioned, completes the short list of ligneous plants; it is, however, of a more robust form than the plant found on Stewart Island and at the Bluff, the flowers being larger, with pure white corollas, which are never pencilled or streaked.

The open land is covered with tussocks of the fine grass *Poa foliosa* Hook. f., a., freely interspersed with masses of *Carex trifida*, the largest of the New Zealand species; a few small plants of no great importance are hidden away in the hollows between them.

One of the most interesting plants in the island is *Colobanthus muscoides* Hook. f., which hitherto has been considered endemic on the Auckland, Campbell, and Macquarrie Islands, where it is plentiful. It is rare and local on the Snares, and appears to be confined to a small swamp in the centre of the island, but its discovery extends its northern range fully 150 miles; subsequently I observed it on Antipodes Island, which shows a still wider extension of its range in an easterly direction. It forms rather large dense masses, the inner portion consisting of the partially decomposed stems and leaves of old plants and the roots of young plants. The seeds often germinate in the capsule, and it was no uncommon thing to find capsules still attached to the stem, and with apparently perfect seeds embedded some three or four inches below the surface of the mass, the old surface having become covered with a growth of young plants too quickly to allow of the germination of the buried seeds.

Another interesting plant was a new *Ligusticum*, which I have named *L. acutifolium*; it was only observed in one place, at an altitude of about 350 feet above sea level; its stems below the leaves were nearly as thick as a man's wrist, the entire plant being four feet high: a description is appended.

The most striking herbaceous plant is undoubtedly the punui, *Aralia Lyallii* T. Kirk, var. *robusta*, the large orbicular leaves of which are sometimes two feet in diameter. It differs from the typical form in the absence of the remarkable stolons of that plant; in the petioles being very stout, flat on the upper surface and convex beneath, giving a plano-convex section; and in being solid, or nearly so, instead of terete, thin-walled, and fistulose. The flowers also, although forming equally large masses with the type, are individually smaller, and invariably of a pale dull yellow hue, never lurid; but there is no structural difference, although it must be admitted that at first sight the plant appears to differ widely from the type.

(To be continued.)

THE ALGÆ OF THE CLYDE SEA AREA.

(With Map.)

The following description of the physical and biological conditions of the Clyde Sea area, and the map which illustrates them, have been prepared by John Murray, Esq., LL.D., F.R.S.E., &c. The list of Algæ, based on the herbaria of Mrs. David Robertson, Fernbank, Millport, and Prof. Thomas King, Andersonian College, Glasgow, has been made by Mr. E. A. L. Batters, LL.B., F.L.S., on his determinations of these specimens. The list has been supplemented by Miss Carruthers, who has searched the herbaria of the British Museum and Kew Gardens (partly) for Clyde localities.

The issue of the list in its present form is for the use of collectors of Algæ in the area, and for the purpose of informing possessors of herbaria of the aims of the Committee for the Exploration of the Marine Flora of Western Scotland. Prof. Bower, F.R.S., Glasgow University, has promised a list of localities from the herbarium of the late Walker Arnott. Similar services will be duly acknowledged in the Report on the Marine Flora of Western Scotland, of which Part I., The Clyde Sea Area, now chiefly engages the attention of the Committee. In its final form the distribution of the Algæ of the Area will be given according to the natural basins described by Dr. Murray.

George Murray (*Secretary*).

British Museum, Natural History, Cromwell Road, London, S.W.

THE CLYDE SEA AREA.

By John Murray, LL.D., Ph.D., &c.

The Clyde sea-area is a natural system of deep-sea basins or lochs in the west of Scotland, communicating southward with the Irish Channel by a single opening between the Mull of Cantyre and the shores of Wigtown and Ayr. During the past few years this system of lochs, together with others further to the north, have been systematically examined as to their physical and biological conditions by Mr. John Murray, Dr. H. R. Mill, Mr. W. E. Hoyle, Prof. J. R. Henderson, Mr. David Robertson, and other naturalists, chiefly from the steam yacht 'Medusa.'

The Clyde sea-area has a water-surface of about 12,000 square miles; it receives the drainage of 3300 square miles of land. At low water it contains a volume of 25½ cubic sea-miles of water. The greatest depth is 107 fathoms, and the mean depth about 29 fathoms. About 1·1 cubic sea-miles of water are added and withdrawn at each tide. The land to the eastward of the sea-area is comparatively low, while that to the north and westward, into which the sea-lochs penetrate, is for the most part steep and mountainous, rising at some points to over 2000 ft. above sea-level.

The seaward portion of the area comprises: (1) the Plateau, with an area of 313 square miles, over which there is an average depth

of 24 fathoms. This plateau extends from the Mull of Cantyre to the Ayrshire coast, and blocks, beneath the depth of 24 fathoms, the entrance to the deeper basins beyond. (2) The Arran Basin, with an area of 685 square miles, has a depth in some points of 107 fathoms. The deepest part of this basin forms a lamba-shaped (λ) depression around the north of Arran, one branch running north to Loch Fyne, another lying between Arran and Cantyre, and the third between Arran and the coasts of Bute and Ayr. This seaward portion of the Clyde sea-area has an average rainfall of 44 inches.

The landward portion of the Clyde sea-area embraces: (1) The Dunoon Basin, with an area of 47 square miles, and a maximum depth of 55 fathoms. This basin is joined by (2) the estuary of the Clyde, off which branches the small Gareloch (3). To the north the Dunoon Basin terminates in two depressions, Loch Goil (4) and Loch Long (5), from which it is separated by bars rising to about 10 and 20 fathoms respectively from the surface. The Arran Basin is similarly barred off from Loch Fyne, at Otter and Minard, by depths of 22 fathoms, the upper basin of Loch Fyne (6) having a maximum depth of 77 fathoms. Connected with the Arran and Dunoon basins are shallow indentations, named Kyles of Bute, Loch Ridun, Loch Strivan, and Holly Loch.

The months of maximum rainfall over the whole sea-area are December and January; those of minimum rainfall, April and May.

The salinity of the water varies with the rainfall, being least in February, and greatest in July and August. The surface water is subject to the greatest range; the deeper water varies much less in salinity. Even at the heads of the lochs, 50 or 60 miles from the sea, the amount of pure sea-water present is rarely less than 88 per cent., the fresh river-water, which pours in in enormous volume after heavy rain, rapidly mixing with the sea-water, which is constantly removed by the tide. This process is so rapid and complete that the amount of river-water actually present, diluting the sea-water in the Clyde sea-area, is not equal to half the annual rainfall. On an average, 1¼ cubic miles, 97·5 per cent. of which is pure sea-water, and 2·5 per cent. fresh water, enters with each tide, and a slightly greater amount is withdrawn, the whole being a little freshened, containing 2·7 per cent. of fresh water. The high salinity of the deep water of the sea-lochs appears to be due to two causes. One is the thorough mixture of the water from surface to bottom, as it crosses the sills barring off the lochs from the outer basins. The saltest surface water within the Plateau is always found off Otter beacon, at the mouth of Loch Fyne, where marked up-welling occurs with the flood tide. Another cause is the influence of the wind. When the wind blows up a loch, the freshest surface water is banked up towards the head; but when it blows steadily down a loch, the fresher water is driven outward, and very salt water from below rises to take its place. With down-loch winds the highest salinity on the surface in Loch Strivan and Loch Fyne has been often observed to occur at the very head of the lochs.

In the Irish Channel beyond the Plateau the temperature of the water from surface to bottom is nearly the same at all depths at

any one time, though varying with the season; this is due to rapid mixture and up-welling in the Irish Channel. In the lochs within the Plateau there is a different distribution of temperature. The temperature of the surface water has the greatest range; it comes to a maximum (55° to 60° F.) in August and September, and a minimum (30° to 40° F.) in January and February. In the isolated basins the minimum (40° to 46° F.) at the bottom does not occur till June or July, and the maximum is retarded till January and February, when the lowest temperatures occur at the surface. Off-shore winds in these lochs bring cold water to the surface during the summer months, and warm water to the surface during the winter months.

There is a great variety in the pelagic fauna and flora (Plankton) in the surface and intermediate layers of water, the abundance and the species of organisms varying in the different layers according to the seasons, and even in different years. There is likewise a great variety in the bottom-living fauna and flora (Benthos), which varies according to the depth and nature of the bottom in the different parts of the area. In some of the deeper lochs a few animals are met with which do not usually occur in more open situations around our coasts till a depth of 200 or 300 fathoms is reached. Some of these forms are limited to one loch on the west coast; for instance, *Conchæcia elegans*, which is abundant in Loch Etive. This form has never been taken in any of the lochs of the Clyde sea-area, although *Euchæta norvegica*, with which it is associated in Loch Etive, occurs abundantly in Upper Loch Fyne and Loch Goil. *Nyctiphanes norvegica* and *Boreophausia Raschii*, which are abundant in the deeper lochs of the Clyde sea-area, do not, on the other hand, occur in Loch Etive.

Papers dealing with Clyde Sea-area.

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Murray, John.—On the Effects of Wind on the Distribution of Temperature in the Sea- and Fresh-water Lochs of the West of Scotland, *Scot. Geogr. Mag.*, vol. iv. pp. 347–357, 1888.

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Mill, H. R.—Temperature of Water in Clyde Sea Area, *Nature*, vol. xxxvi. pp. 37–39, 56–58, 1887.

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Henderson, J. R.—The Decapod and Schizopod Crustacea of the Firth of Clyde, *Trans. Nat. Hist. Soc. Glasgow*, 1886.

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Hoyle, W. E.—On the Deep-water Fauna of the Clyde Sea-area (with map), *Journ. Linn. Soc., Zoology*, vol. xx. pp. 442–472, 1889.

Günther, A.—Report on the Fishes obtained by Mr. J. Murray in Deep Water on the North-west Coast of Scotland, between April, 1887, and March, 1888, *Proc. Roy. Soc. Edin.*, vol. xv. pp. 205–220, 1888.

HAND-LIST OF THE ALGÆ.

By E. A. L. Batters, LL.B., F.L.S.

The following list, prepared at the request of the Committee formed for the investigation of the Marine Algæ of the Clyde, is intended to show as far as possible what has already been done in that direction, and at the same time to indicate what still remains to be done. As a result of the investigations undertaken by myself and others, a large number of species and varieties have been added to the existing records, but a careful examination of the Hennedy and Arnott collections, which is greatly to be desired, would probably largely increase this number. The additions to Mr. Mahoney's list, the most recent known to me, are marked by an asterisk.

Owing to the very short time at my disposal, I feel that the list is necessarily incomplete and faulty, but I hope that it will be found to serve the only purpose for which it was prepared—that of laying the foundation of a more complete list of Clydesdale Marine Algæ than at present exists. I had hoped that the name of my valued friend, Mr. E. M. Holmes, whose well-known ability and long acquaintance with the British Marine Algæ render him singularly fitted for the task, would have been joined with mine on the title of this paper, but he is so fully occupied at present that he could not spare the time necessary for such an undertaking.

Series CYANOPHYCEÆ.

Cohort Chroococcineæ.

Order Chamæsiphonaceæ.

*Dermocarpa Crn.

D. prasina Born. I detected this microscopical alga, growing in company with *Pringsheimia scutata* Rke., on a specimen of *Rhodochorton Rothii* Näg., from Cumbrae, in Mrs. Robertson's collection of Clydesdale Algæ.

Cohort Nostochinæ.

Section Hormocysteæ.

Tribe Oscillarieæ.

Spirulina Link.

S. major Kütz. = *S. Hutchinsiæ* Kütz. Cumbrae! Arnott in Herb. Harv. et Grev.

S. tenuissima Kütz. "Common," M.

Note.—Throughout this catalogue, M. = Mr. J. A. Mahoney's List of the Marine Algæ of Clydesdale in *Notes on the Flora and Fauna of the West of Scotland* (Blackie & Son, 1876). D. R. = Mrs. David Robertson's Herbarium. The other contractions are in such universal use that they need no explanation.

OSCILLARIA Bory.

O. subuliformis Thw. "Frequent, Largs," M.

O. insignis Thw. "Frequent, Cumbrae," M.

O. Corallinæ Gom. = *O. litoralis* Phyc. Brit. "Common," M.

LYNGBYA Ag.

**L. æstuarii* Lieb. In Mrs. Robertson's collection there is a species, labelled in Dr. Landsborough's writing, "*Calothrix*, new species, 10.53. Cumbrae."

L. majuscula Harv. Cumbrae, M. In Mrs. Robertson's collection there are several specimens of this species gathered at Loch Ryan, just beyond the limits of the Firth of Clyde, but none actually from the Firth.

*SYMPLOCA Gom.

**S. fasciculata* Kütz. There is a specimen of this species labelled "*Calothrix pannosa*. Cumbrae, 10.53" in Mrs. Robertson's herbarium. I was at first doubtful whether the specimen should be referred to *S. fasciculata* or *S. hydnoides* Kütz., but on measuring the breadth of the filaments, which was 9–10 μ, all my doubts were removed.

Tribe VAGINARIEÆ.

MICROCOLEUS Desm.

M. chithonoplastes Thur. Cumbrae! Largs! Herb. Cutler in Brit. Mus. "Ayrshire, Dr. Dickie," Johnstone & Croall, iv. p. 181. Hunterston Point! Herb. Grev.

Section HETEROCYSTEÆ.

Order RIVULARIACEÆ.

Tribe MASTICHOTRICHEÆ.

CALOTHRIX* C. Ag.

C. confervoides C. Ag. Cumbrae! D. R. Ardrossan. Herb. Brit. Mus. "Arran," Lands.

C. scopulorum C. Ag. Cumbrae! D. R. "Holy Isle," M.

C. pulvinata C. Ag. = *C. hydnoides* et *C. pannosa* Phyc. Brit. Cumbrae! D. R. "Common," M.

C. fasciculata C. Ag. "Cumbrae," M.

RIVULARIA Roth.

R. Biasolettiana Mengh. = *Schizosiphon Warreniæ* Phyc. Brit. "Arran," M.

R. atra Roth. "Corriegills," M.

R. nitida C. Ag. = *R. plicata* Phyc. Brit. Arran!

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* *Calothrix luteola* of Phyc. Brit. is a species of *Leptomitus*, a Schizomycetous fungus.

Order Nostocaceæ.

Nostoc Vauch.

N. Linckia Born. = *Monormia intricata* Phyc. Brit. Cumbrae! Hennedy in Herb. Brit. Mus. et D. R. "Largs," M.

Anabæna Bory.

A. variabilis Kütz. = *Sphærozyga Thwaitesii* Phyc. Brit. Cumbrae! Arnott in Herb. Grev.

A.? Broomei = *S. Broomei* Thw. "Rare, Arran," M.

Nodularia Mert.

N. spumigena Mert. *β. litorea* Born. et Flah. = *Spermoseira litorea* Phyc. Brit. Cumbrae! Hennedy in Herb. Brit. Mus. et Herb. Grev.

(To be continued.)

TWO WILLOW HYBRIDS.

By Edward F. Linton, M.A.

Two or three hybrids of Willows have come in my way in the course of my visits, in company with my brother, to Scotland, which apparently have not been described, and I propose to describe two of them without further delay. The freedom with which the species in this genus hybridise, and the interesting fact that the resultant hybrids are often fertile and capable of blending with a third species, are topics which have been so well illustrated in Dr. F. B. White's recent Revision of British Willows, that I will not here make any general remarks on the subject.

1. Salix Arbuscula × nigricans, n. hybr.—I gathered the specimens I have of this some years ago, but laid them in with other *nigricans* forms, as a variety which I could not name. They did not attract my attention again till last year, when I was struck by the small leaves and fruit, and the facies of one of the specimens. This has the leaves of the usual shape and size of *S. Arbuscula* L., crenate, pubescent at first on both surfaces, but becoming quite glabrous on the upper surface; very glaucous on the lower, and with the pubescence persistent. In both specimens the leaves turned black, and this feature led me to place them for so long among the *S. nigricans* varieties. *S. nigricans* and *S. Arbuscula* were the prevailing willows, and, as far as I remember, the only willows on this group of rocks, which are situated in the Breadalbanes, in Mid-Perth. The fruit on the first gathered specimen is gone over, and mostly split; it is small, hardly larger than in *S. Arbuscula*, but densely compacted, and forming a broader catkin than this parent ever does. The ovaries, which are subsessile, have a fair amount of short pubescence, and a short style deeply divided (apparently to the base), with stigmas shortly bifid.

My other specimens, gathered in 1883, in company with Rev. W. R. Linton, on the same rocks, differ in some respects from the preceding. The leaves are rather larger, and, being more pubescent

on the under surface and much less glaucous, give the appearance of being small *nigricans* leaves. They have a blunt serration, which might be found in either species. But the upper surface of the leaf is, or at least soon becomes, quite glabrous, and shining; and is markedly reticulate with raised veins, a strong evidence of the *Arbuscula* parentage. The fruit in this is in much better condition; the ovaries are thinly pubescent, narrow conic, mostly sessile, or the lower ones subsessile; style moderately long, deeply cleft above; stigmas also cleft. Catkins small, hardly longer, but decidedly broader than those of *Arbuscula*.

The descriptions as given above purposely bring out the *Arbuscula* origin most fully, as that was at first most obscure. The habit of the bushes, the blackening of the specimens in the press, besides catkin characters referred to above, and the presence of galls in the leaves, which frequently infest *S. nigricans*, and which *S. Arbuscula* is usually free from, were such obvious evidence of the *nigricans* connection, that, as I have said, its true origin did not occur to me till last year.

2. S. LANATA × LAPPONUM, n. hybr. — From a bush in Glen Callater, which was met with by Mr. F. J. Hanbury, Rev. W. R. Linton, and myself, I have specimens in mature foliage, which are without doubt this hybrid. The cuttings I took failed, and I have not succeeded yet in re-visiting the spot; but there is no reason for delaying the description. The mature leaves (1½–2 in. by ¾–1 in.) are oblong-ovate, subacute, with the tip twisted more often than not; margin waved, entire or slightly crenate; principal veins impressed on the upper surface, which is of an opaque green, made rather hoary with woolly silk, more persistent than is usual with Glen Callater *S. lanata;* under surface white, with dense woolly tomentum. The petioles are long, being one-third or more the length of the blade, and are much enlarged at the base. The buds and young twigs are clothed with (deciduous) long, silky down. The wood and the shape of the buds are intermediate between the two parents.

This plant took its habit of growth rather from *S. lanata*, also the shaggy clothing of the leaves, buds, and young wood; the great breadth and size of the leaves, too, comes from this parent, which has them remarkably rotund in Glen Callater, and the *aurita*-like twisting of the tip comes from the same source. The *Lapponum* influence shows itself in the more persistent and tomentose clothing of the leaves, and in their veining; in the remarkably broadened base of the petiole, which acts like a protecting flap to the bud in *S. Lapponum;* in the rather elongated and pointed buds; and in the stipules being almost entirely obliterated. *S. Lapponum* appears to have this effect commonly with its hybrids. Here it is very curious: the large foliaceous stipules of *S. lanata* are reduced to a few small wizened things that are not noticed without being carefully looked for.

Rev. W. R. Linton and I had hoped that one of our Clova plants, a small seedling, might prove this; but it has not done so. One would expect this hybrid to be of rather frequent occurrence,

as the two willows are nearly allied, and often occupy the same localities. I know no reason why the contrary should in fact be the case.

SHORT NOTES.

Zannichellia. — In the account of this genus, by Herr L. Schlegel, in the new edition of Hartman's *Skand. Flora*, two characters are mentioned, which seem to have escaped notice here. After pointing out that all the Scandinavian species are included under the name *Z. palustris* L. (*Sp. Plant.* ed. 1), the genus is separated into two sections, as follows :—* Stigma papillose; nuts tapering at both ends, = *Z. major* Boenn. :—** Stigma smooth; nuts rounded at both ends, including *Z. pedunculata* Reich. and *Z. polycarpa* Nolte. In the specific description of *Z. major*, the stigma is stated to be thickly beset with small papillæ on the upper surface; while it is stated to be without papillæ in the other two species. These characters I have not yet had the opportunity of observing. The characters founded on the shape of the nuts (pointed out by Fries) are quite confirmed by the rather numerous British examples in my collection; although the difference is not easily apparent, in the dry state at all events, unless the nuts be really ripe.—W. H. Beeby.

Pyrus cordata Desv.—In connection with the Rev. R. P. Murray's note on p. 186, I may mention that in a reprint from one of the German scientific papers sent to me some time back, Prof. Haussknecht states that he found this species thoroughly wild in the forests of the Pindus range. To illustrate the way in which plants are sometimes classed as non-native on the authority of some distinguished botanist without sufficient evidence, I venture to refer to Hooker's *Student's Flora*, ed. iii. p. 12, where *Helleborus viridis* is said to be "not well established north of the Mediterranean region, *Ball*." Now Mr. Hanbury and myself have both seen it in Kent, in spots where we could have no doubt whatever of its wildness, and in considerable quantity; and Mr. W. W. Reeves recently sent me word of a wood, some five acres in extent, which was quite overspread with it.—Edward S. Marshall.

[There can, I think, be no doubt as to the wildness of *H. viridis* in woods and hedge-bottoms near Wycombe, Bucks.—Ed. Journ. Bot.]

Polygala oxyptera Reichb.—The striking form of this plant from the Tain sandhills, recorded on pp. 109—110, is now identified by Prof. Haussknecht as var. *collina*, Reichb., *Ic. Crit.*, t. 23, f. 46. He is also of opinion that the sedge referred to on p. 116, as probably distinct from *Carex panicea*, is only a depauperate condition of that species, most likely due to frost; and cultivation proves him to be right, for specimens now fruiting in my garden differ in no respect from the type. I hasten to correct the mistaken opinion, for which Mr. Hanbury was in no sense responsible, as he had not seen specimens.—Edward S. Marshall.

ANEMONE TRIFOLIA L. — In the *Boletim da Sociedade Broteriana* for 1886, p. 101, Dr. Mariz describes as a new species, under the name of *A. albida*, a plant which is not uncommon in the north of Portugal. It is the *A. nemorosa* of Brotero, in *Flore Lusitanica*, and may be (as Dr. Mariz remarks) the *A. ranunculoides* of the *Prodromus Floræ Hispanicæ*, so far as the reference to Portugal is concerned. I have only seen leaves in a fresh state, while my only herbarium specimen is in poor condition, and does not show the ripe carpels, which are said to resemble those of *A. ranunculoides*. But I have no doubt that the Portuguese plant cannot be separated from *A. trifolia* L., and that the name *albida* must be dropped, or retained only as varietal. The only difference of any importance (besides that said to be exhibited by the carpels) is derived from the colour of the anthers—white in *albida*, yellow in *trifolia* ("antheris flavis," Willk., sub *A. trifoliâ*). But this character is either wrongly stated, or inconstant. Some years ago I brought roots of *A. latifolia* from the Tyrol, and they are now flowering freely in my garden: the anthers are *white*, without any tinge of yellow.—R. P. MURRAY.

NOTICES OF BOOKS.

The Making of Flowers. By the Rev. Prof. GEORGE HENSLOW, M.A., F.L.S., F.G,S., &c. London: Society for Promoting Christian Knowledge. 1891. 8vo, pp. vii. 168, 24 cuts. 2*s.* 6*d.*

THE author of this little book is a firm believer in the evolution of species one from another, but is dissatisfied with the explanation afforded by "natural selection." This he tells us, truly enough, "means simply that the majority of the offspring of a plant die, and the few survive" (p. 150); but he does not tell us why of the survivors some differ from the parent. He has accordingly sought for an agent more satisfactory, and this he finds in "environment." Conditions of climate and soil, he holds, do something towards working the change, and so more especially does the influence of insects. "The living protoplasm of the plants has responded to the irritation set up by insects, and the flowers have grown in adaptation to them." The course of plant history as worked out in accordance with this premise is the opposite of what has been taught by other evolutionists. Instead of development towards the perfect type, degradation from it has been the order of the day. A perfect and regular flower, like the buttercup, was the virginal form, from which others have fallen away, altering or losing organs in the course of time. The response of the flower to these insect irritations is "automatic, and not volitional" (p. 147). "They cannot help themselves"; moreover, the absence of such irritations may produce an effect analogous to that of their presence, for "wind-fertilised flowers are without much doubt degradations from a previously insect-fertilised condition" (p. 102), and one cause of such degradation "is presumably the neglect or absence of the proper insect-fertilisers."

All this, as is obvious, completely upsets previous ideas; in fact, says our author, these were all wrong (p. 147). But supposing all his facts to be just as he writes, and all the changes he describes to have followed on irritation or non-irritation of flowers by insects, how much nearer are we at the end of it all to an understanding of the "making of flowers"? What is such an argument as his but one illustration more of the ancient fallacy, *post hoc, ergo propter hoc?* The presence of external circumstances induces a plant to modify itself so as better to face them, to furnish itself with new apparatus making it possible to live; but can the circumstances be said to make the apparatus, any more than the east wind has made fur coats for man? There is indeed, in the present case, the additional inconvenience of supposing the new apparatus to have been sometimes produced by a negation,—the neglect or absence of insects,—which is like imagining stone implements to have been made by the absence of metals.

Prof. Henslow's laborious little treatise seems in fact to bring out nothing more strongly than the fatality of trying to solve the problem of a plant's biological history, till we have first solved that of life as exhibited by the plants around us. When we shall understand the flower in the crannied wall, "root and all and all in all," then shall we be able to understand also not only "what God and man is," but how the flower itself came to be what it is. What is the force of the terms employed? What is "irritation"? How do we know that insects "irritate" flowers? What is meant by the plant "responding" to such irritation? Whence does it get the "automatic" power of so responding? Above all, how does it come to possess a variety of responsive powers to be used according to varying circumstances? The force, whatever it be, which we find in operation, resides in the organism itself, not in external circumstances: these cannot make it, but only call it into play. To say otherwise would be like saying that Stephenson devised the locomotive, not by his native wit, but because he had to work for his bread.

JOHN GERARD.

Elementary Text-book of Botany, for the use of Schools. By EDITH AITKEN. London: Longmans, Green & Co. 1891. 8vo, pp. 248, 131 cuts.

Botany. A concise Manual for Students of Medicine and Science. By ALEX. JOHNSTONE. Edinburgh: Pentland. 1891. 8vo, pp. xiv. 260, 164 cuts. 6s.

Elementary Botany. By JOSEPH W. OLIVER. Glasgow: Blackie & Son. 1891. 8vo, pp. 208, 150 cuts.

IT is matter for regret in some respects that botanists have apparently given up the practice of writing elementary class-books of their subject. While nothing better could be desired than Prof. Oliver's *Lessons in Elementary Botany*, there is an acknowledged want of other books to supplement it in certain departments of the subject. There is now-a-days so much more teaching of Botany in schools than was formerly the case, and this teaching,

and the instruction given in certain colleges as well, has got so decidedly out of the hands of working botanists into those of teachers pure and simple, that a new fashion of class-book has been evolved into which the writer puts his whole stock of information. One is tempted to ask—Is it Botany? It is certainly not elementary Botany, as taught in Prof. Oliver's *Lessons*, and it has little or no relation to the Botany of the working naturalist. If the old dry and repellent class-book of, say, forty years ago were an abuse of Botany, these moderns have more of the abuse than of Botany in their composition; and the latter abuse is of the "type system." The author of the little book on the *Diseases of Crops* (noticed at p. 187) quotes the saying of "the celebrated Rousseau," that one can be a "very great botanist without knowing the name of a single plant." This gifted writer was plainly the author of the "type system" of teaching Botany, and the Science and Art Department and Cambridge have merely plagiarised the luminous idea. The possible very great botanists nurtured in this way have mostly found it desirable to learn something more to eke out the potentiality, while others have maintained their embryonic state. It is the latter sort that have the most courage in the way of teaching and writing class-books.

Miss Aitken has made an effort to supply a book which, while adhering to the type system, should wisely begin with the familiar forms of flowering plants. These are dealt with in Part I. There is then a jump to *Protococcus*, and a gradual ascent to the flowering plant again, which is reached in Part III., where its minute structure and physiology are discussed. There is a sort of reason for this arrangement, but surely it would have been better to have kept a steadily descending course. Miss Aitken has done her work with much ability, and her book will undoubtedly be useful in her own hands and in those of careful and thoughtful teachers; but it is capable of being so used that the pupil will be left with a very mixed notion of the relationships of plants—"the bowsprit gets mixed with the rudder" too much. The old friends in the way of woodcuts are well chosen; the new ones are rather alarming, and not well done. One of them, labelled "Forget-me-not," is in little danger of oblivion—it is the sort of obtrusive vision that haunts one in the "dead waste and middle of the night." There are a number of minor errors.

It is hard to understand how Botany is to be learnt from Mr. Johnstone's Manual. On the first page, among the answers to "What is Life?" the young beginner is told that living things "possess metabolic power." His book is like living protoplasm—"an incomprehensible mixture" (same page). There are many good woodcuts (mostly borrowed), and text more or less about them, arranged on a sort of type system, prefaced by an introduction on Structural Botany. The hardened botanist sometimes has his work cut out for him to follow Mr. Johnstone, who writes in an examination-paper style. It is a book for the compulsory student, and he will take his pleasure sadly who toys with this handmaid to medicine.

Mr. Joseph W. Oliver's *Elementary Botany* is a really good book. Remembering his great namesake and *his* popular book, we almost regret that Mr. Oliver did not present it under a different name—Roland or another. Being a good book,—there is none better among elementary works, except Prof. Oliver's,—and certain to become popular, it is really to be regretted that there is this danger of confusion. At the same time, the buyer will suffer no harm in either case. Mr. Joseph W. Oliver writes clearly and attractively; his book is excellently arranged, and capitally illustrated. It would be excellent advice to a beginner who wished to know "which Oliver" he should get, to tell him to get both, and take the first 160 pages of Mr. Joseph Oliver's, then omit his Natural Orders, and go on to those of Prof. Oliver. It is most refreshing to meet with so admirably written a class-book,—free from the vices of the type system and of the translation from the German,—with abundant and excellent information on both the external morphology and the minute structure and functions. It deserves the widest success.

G. M.

NEW BOOKS.

—. Blanchet.—'Catalogue des plantes vasculaires du Sud-ouest de la France.' Bayonne, Laserre. 8vo, pp. xviii. 172.

W. J. Gordon.—'Our Country's Flowers, and how to know them.' Illustrated by John Allen, "with over 1000 examples in colour and outline." London: Day, Son & Co. 8vo, pp. 154. 6s.

O. Kirchner.—'Die mikroskopische Pflanzenwelt des Süsswassers.' Braunschweig, Haering. 4to, pp. xii. 60, tt. v.

A. Mazel.—'Études d'anatomie comparée sur les organes de végétation dans le genre Carex.' Genève, Georg. 8vo, pp. 213, tt. vii.

A. Stutzer.—'Die Düngung der wichtigsten tropischen Culturpflanzen.' Bonn, Cohen. 8vo, pp. 111.

R. Weber.—'Lehrbuch der Forsteinrichtung.' Berlin, Springer. 8vo, pp. x. 440.

ARTICLES IN JOURNALS.

Ann. Sciences Nat. (Botanique, Sér. vii. vol. xiii. nos. 3 & 41).—C. Sauvageau, 'Sur les feuilles de quelques Monocotylédones aquatiques.'

Bot. Centralblatt. (Nos. 23–25). — P. Schumann, 'Zur Kenntniss der Greuzen der Variation in anatomischen Bau derselben Pflanzenart.'

Bot. Zeitung (May 22–June 12). — C. Wehmer, 'Entstehung und physiologische Bedeutung der Oxalsäure im Stoffwechsel einiger Pilze.'

Bull. Soc. Bot. France (xxxviii.: Comptes Rendus, 2: May 1).—
—. Godfrin, *Urocystis primulicola*.—E. Roze, *Urocystis Violæ*.—P. A. Dangeard, 'Sur une Ustilaginée parasite des *Glaucium*.'—H. Coste, *Silene nemoralis*.— G. Rouy, *Asperula bætica*, sp. n.— E. G. Camus, '*Cirsium pulchrum* (*C. lanceolatum* × *C. arvense*).' — Id., 'Étude sur le genre *Cirsium*.' — A. Chatin, 'Notice sur J. Clarion' (1776–1844). — Id., 'La biologie des plantes parasites.' — G. Rouy, 'Annotations aux *Plantæ Europææ* de K. Richter.' — A. Lombard-Dumas & B. Martin, 'Florule des causses de Blandas, etc. (Gard).' — J. Vallot, 'Persistance de la vie chez un sapin.' — P. van Tieghem, 'Classification anatomique des Mélastomacées.'—(Comptes Rendus, 3: June 1). —. Thouvenin, 'Présence de laticifères dans *Cardiopteris lobata*.'—G. Camus, 'Hybrides d'Orchidées.'—H. Hua, 'Un *Cyclamen* double.'—P. van Tieghem, 'Structure et affinités de *Stachycarpus*, gen. nov.' (Coniferæ).—Id., 'Structure et affinités des *Cephalotaxus*.' — L. Mangin, 'Sur la désarticulation des conidies chez les Péronosporées.' — P. Vuillemin, 'L'evolution de l'appareil sécréteur des Papilionacées.' — E. Prillieux, 'Le Siegle enivrant' (*Endoconidium*, gen. nov.).

Bull. Soc. Linnéenne de Paris (No. 117).—A. Franchet, 'Sur une Boraginée à nucules dehiscentes' (*Schistocaryum*, gen. nov.). — H. Baillon, '*Oncotheca*, gen. nov.' — Id., 'Sur les Galacées.' — Id., 'Sur les Sapotacées de la Nouvelle-Calédonie.'—F. Heim, 'Influence de la lumière sur la coloration du périanth de l'*Himantophyllum mexicanum*.'—(No. 118). H. Baillon, 'Les *Phelline* de la Nouvelle Calédonie.'—Id., 'Les ovules des Oleacées.'

Bull. Torrey Bot. Club (June). — T. D. A. Cockerell, 'Flora of High Altitudes in Custer County, Colorado.' — J. J. Chamberlain, 'Comparative Study of Styles of Compositæ' (2 plates). — A. A. Heller, 'Notes on Flora of S. Carolina.'

Gardeners' Chronicle (May 30). — *Tulbaghia natalensis* Baker, *Scilla laxiflora* Baker, spp. nn.—(June 6). *Trichocentrum triquetrum* Rolfe, *Crinum Roozenianum* O'Brien, spp. nn.—(June 13). *Bauhinia Galpini* N. E. Brown, *Rodriguezia anomala* Rolfe (fig. 145), spp. nn. —(June 27). W. G. Smith, 'Disease of Hollyhocks' (figs. 157, 158).

Journal de Botanique (June 1). — P. van Tieghem, 'Un nouvel exemple de tissu plisse.' — A. Briard & P. Hariot, 'Mycetes novæ.' — E. Bonnet. 'Itinéraire botanique d'une ambassade française au Maroc.' — —. Hue, 'Lichens de Canisy.' — (June 16). Drake del Castillo, 'Légumineuses recueillies au Tonkin par M. Balansa en 1885–89' (*Millettia eurybotrya*, *M. ichthyochtona*, *M. pachyloba*, spp. nn.).—- A. Fremont, 'Sur les tubes cribles extra-liberiens dans la racine des Œnothéracées.' — E. G. Camus, 'Sur les *Drosera* observées dans les environs de Paris.'

Journ. Linnean Society (Botany, xxviii. 193: May 26). — R. J. Harvey Gibson, 'Development of Sporangia in *Rhodochorton*' (*R. seiriolanum*, n. sp.: 1 plate).—A. L. Smith, 'Development of Cystocarps in *Callophyllis laciniata*' (1 plate).—G. Murray & E. S. Barton, 'Structure and Systematic Position of *Chantransia*' (*C. Boweri*, n. sp.: 2 plates). — Sir John Lubbock, 'Stipules; their form and

function'; 'Form of Leaf of *Viburnum Opulus* & *V. Lantana*'; 'Fruit and Seed of *Juglandeæ*.'

Oesterr. Bot. Zeitschrift (June). — F. Arnold, 'Lichenologische Fragmente.' — *Campanula epigæa* Janka, n. sp. — L. Celakovsky, 'Ueber die Verwandtschaft von *Typha* und *Sparganium*.'—A. Zahlbruckner, 'Zur Kryptogamenflora Oberösterreichs.' — K. Polák, 'Zur Flora von Bulgarien.' — E. Junger, 'Botanische Gelegenheitsbemerkungen.' — P. A. Saccardo, 'Rathschläge für Phytographen, insbesondere für die auf dem Gebiete der Kryptogamenkunde.'

Pharmaceutical Journal (June 20). — E. M. Holmes, 'Notes on Chinese Drugs.'

Trans. Linnean Soc. (Bot. iii. 2). — A. Barclay, 'Life-history of a remarkable Uredine' (*Uromyces Cunninghamianus*, n. sp.: 2 plates). —(iii. 3). W. Mitten, 'Musci and Hepaticæ recorded from Japan' (1 plate).

BOOK-NOTES, NEWS, &c.

Mr. Spencer Le Marchant Moore has been appointed botanist to the Matto Grosso Gold and Explorations Concessions Expedition, which is on the eve of departure for Brazil. The head-quarters of the expedition will be at Cuyaba, and it is expected that explorations will be made eastward, across the Matto Grosso plateau, the flora of which is practically unknown.

The May and June number of the *Kew Bulletin* is devoted to a "Report of a Botanical Mission to the West Indies, undertaken by the Assistant-Director, Royal Gardens, Kew." Much interesting information is scattered through the sixty-six pages devoted to the Report, which is well worth its price—4d.

Messrs. Baillière send us two recent additions to their 'Bibliothèque des Connaissances Utiles': *Les Plantes d'Appartement et les Plantes de Fenêtres*, by M. D. Bois, and *Les Arbres Fruitiers*, by M. G. A. Bellair. The little volumes are cheap (4 fr. each), and nicely got up, but their interest is horticultural rather than botanical.

Dr. Woolls has issued an enlarged and improved edition of his *List of Plants indigenous to and naturalised in the Neighbourhood of Sydney*, which first appeared in 1880.

We have received *Tongues in Trees and Sermons in Stones*, by the Rev. W. Tuckwell (London, George Allen), a pretty little volume dealing in a pleasant, popular fashion with plant-lore of various kinds, and adorned with suitable illustrations.

We take the following from *Nature* of May 28:—"We are informed that Kew has recently acquired by purchase from Mr. F. Curtis, a descendant of William Curtis, the founder of the *Botanical Magazine*, about 1650 original drawings, chiefly of figures which appeared in that publication. They belong partly to the first series and partly to the second, from 1800 to 1826—that is to say, during the period that the *Magazine* was edited by Dr. Sims. Many

of these drawings are very beautiful, and very carefully coloured, especially those done by James Sowerby and Sydenham Edwards; but some of the finest of their work was not reproduced in the plates. The collection also includes some of the poorest work that ever appeared in the *Magazine*. In 1815 Sydenham Edwards seceded, and worked for the rival *Botanical Register;* Sowerby had ceased contributing, and there seems to have been a lack of novelties for illustration. Towards the end of Dr. Sims's editorship, in 1826, the *Botanical Magazine* was doubtless supplanted in a great measure by the *Botanical Register*, then conducted by the vigorous Lindley. Its circulation greatly decreased, and the impression was small; hence this series is very rare. The following year, however, Sir William Hooker became editor, and speedily raised both the artistic and botanical character of the *Magazine*. Many of the plates published during the latter half of Dr. Sims's editorship are not signed, but all the drawings are; and we learn that William Hooker, the artist of the *Paradisus Londinensis*, was an occasional contributor. The collection also contains a number of unpublished drawings."

The *Report of the Felsted School Natural History Society for 1890* contains a long "list of rare, local, or otherwise interesting British plants grown in the Society's Weed Gardens," and two or three additions to the local Flora.

Dr. Sorauer has issued the first number of a new journal, the *Zeitschrift für Pflanzenkrankheiten*, which is to be devoted to the diseases of plants. It is published by Ulmer, Stuttgart.

The second volume of Prof. Sargent's sumptuous *Silva of North America* has been issued; it carries the enumeration on to *Sapindaceæ*.

We have received the second edition of the *Flora of the Stonyhurst District* (Clitheroe, Parkinson). The district is a ten miles' radius from Stonyhurst College, and includes portions of West and South Lancashire and Mid-West Yorkshire. There is no author's name. In the preface we read: "Our list being primarily intended for young botanists, special prominence has been given to English names: in some instances these have had to be manufactured"! The nomenclature employed is that of the *London Catalogue*.

The Rev. Adrian Peacock is collecting materials for a Flora of Lincolnshire. Communications should be addressed to him at Cadney Vicarage, Brigg.

Newspaper Botany is almost always funny, but Mr. W. Roberts, who writes in the *Pall Mall Gazette* of June 23rd to correct Lord Randolph Churchill's nomenclature, is in advance of most of his class. "*Combretum*" is quoted from his lordship's remarks, with "(sic)" appended to it, and "*Combretium*" is given as the correct form. "'*Olea fragrans*,'" says Mr. Roberts severely, "looks well, but readers would understand what was meant much better if the single name of 'Olive' were given." *Olea fragrans* is of course *not* Olive, but an old name for *Osmanthus fragrans*. The lofty tone of Mr. Roberts's letter is very amusing.

OBITUARY.

Tuffen West was born at Leeds in 1823. He was a son of the late Wm. West, F.R.S., the well-known chemist, who founded the business now carried on by Harvey and Reynolds. He was educated at the Friends' School, York, and was one of the earliest members of its Natural History Society, of which he was the "Polytechnic" curator in 1838. "Polytechnics" then included Zoology, and he set up successfully several skeletons, which are still in the school-museum. After leaving school, he studied for a doctor, but, we believe, never took his medical degree. He removed to London, where for many years he was looked upon as the best illustrator of microscopic books, the best known being Smith's *Synopsis of the British Diatomaceæ*, 1853–1856. Towards the latter end of his life his health failed, and he was obliged to give up work. He died at his residence at Frensham, March 19th, 1891. Tuffen West was a Fellow of the Linnean Society, to which he was elected in 1861, but his deafness prevented him from taking part in its meetings.

Dr. Richard Schomburgk, who had been for a quarter of a century Director of the Adelaide Botanic Garden, died suddenly at the end of last March. He was born at Freiburg on the 5th of October, 1811. Becoming involved in political difficulties in Germany, he, with his brother Robert, made his escape to Australia through the connivance of Humboldt, and there spent the remainder of his life. He published a Catalogue of the Plants cultivated in the Adelaide Garden, of which the first edition appeared in 1871; and his Annual Reports of the Gardens bear testimony to the activity which he displayed in their management. His publications were mostly devoted to the economical side of South Australian Botany. In 1876 he issued *Botanical Reminiscences of British Guiana*—an interesting account of the Boundary Expedition in 1842 under the command of his brother, to which he was attached as naturalist on behalf of the Prussian Government. The collections formed by the two brothers on this expedition are in various herbaria, and were described by Mr. Bentham; and a valuable collection of drawings made by Sir Robert Schomburgk is in the Botanical Department of the British Museum. The *Botanical Reminiscences* contains descriptions of new species; Dr. Schomburgk's most important contribution to Botany, however, is the Synopsis of the Flora of British Guiana, published in his *Reisen in Britisch Guiana*, 1848.

Peter Martin Duncan, F.R.S., died on May 28th, in his sixty-seventh year. His name is best known in connection with echinoderms and corals, as well as with geology, of which he was Emeritus Professor in King's College, London. He edited the third edition of the *Micrographic Dictionary* from the letter H, and in earlier life devoted much attention to Botany; he contributed 'Observations on the Pollen-tube' to the *Proceedings of the Botanical Society of Edinburgh* in 1856, and published a paper on the histology of the reproductive organs of *Tigridia conchiflora* in the *Quarterly Journal of Microscopic Science* for 1866. Prof. Duncan became a Fellow of the Linnean Society (of which at his death he was a Vice-President) in 1880.

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N.E. Brown.

Epilobium Dunnei J. Clay

EPILOBIUM DURIÆI J. GAY, A NEW (?) ENGLISH PLANT.

By C. B. Clarke, F.R.S.

(Plate 307.)

The species *Epilobium Duriæi* was founded, by name only, by J. Gay in *Ann. Sci. Nat.* ser. 2, v. 6 (1836), p. 223 (misprinted 123), as a split off from *E. montanum* L. The Kew Herbarium contains, from J. Gay herb. propr., the original specimens on which J. Gay founded the species, and various other specimens (one cultivated) authenticated by J. Gay's hand as his *E. Duriæi;* also a printed proof of the diagnosis and description by J. Gay himself of *E. Duriæi*, marked by J. Gay, "*inéd.*," and apparently never published. One of the two original specimens of J. Gay (*viz.*, the right-hand one of Durieu, n. 343, collected in Asturias, 17th July, 1836), is figured in Barbey, *Epilobium*, t. 14; the other, left-hand specimen, is figured Tab. 307, fig. 1. Barbey's figure shows the stolons (soboles hypogæi of Haussknecht) rather too thick; and shows the stem nearly bare at base, *i. e.*, the scales (folia innovatoria kataphylloidea of Haussknecht) formed on the stolon of the preceding summer are *nearly* rubbed off. It is important to note that, in the left-hand specimen of the same original foundation Durieu n. 343, these scales are persistent, and that the suberect stolons spring *above* a number of them. The persistence of these scales into the next summer is seen in most of the other examples of J. Gay, and is a characteristic of *E. Duriæi*.

On 15th July, 1890, in woods 600 ft. above sea-level north of Andover, I was led to dig up a quantity of a small (8–15 in.) neat-looking *Epilobium;* the base of the stems was covered with the remarkably persistent kataphylloid leaves from the preceding year, and there were, on specimens at this date hardly in flower, already pale stolons pushing out below (as well as between) these kataphylloid leaves (Tab. 307, fig. 4). On matching these plants at Kew with J. Gay's type *E. Duriæi*, they appeared to me identical in every particular. At this date, *E. montanum* L., which grew plentifully hard by, was larger, with larger leaves, less bright flowers, and had the base of the stems entirely bare of the kataphylloid leaves of the preceding year.

On the 16th Sept. last I revisited the same spot, and dug up a quantity of the same plant—of course mostly in fruit; the kataphylloid leaves of the preceding year were still often attached; the stolons, often below them very variable in thickness, were more or less elongate (Tab. 307, fig. 5). I forwarded some of these plants to Mr. Nicholson, who has them in cultivation at Kew.

E. Duriæi inhabits the Pyrenees and Switzerland, also the hills of Central France and the Vosges. I have shown some of my Andover material to Mr. J. J. Baker, Mr. N. E. Brown, Mr. Nicholson, and Mr. Arthur Bennett, beside J. Gay's type of *E.*

Duriæi, and (so far as these most experienced observers see without a special study of the group) the match is perfect.

I therefore say that *E. Duriæi* J. Gay is an English plant. But I have, during the summer and autumn, dug up many hundred examples of *E. montanum* L., *in a broad sense*, in various counties, and in various soils; and I have looked through the dried material in the Herbaria of Kew, the British Museum, and Hewett Watson. I am strongly of opinion, with all deference to such a monographer as Hausskuecht, that all this *E. montanum*, *E. sylvaticum*, and *E. Duriæi* is one species; and that Bentham was right in maintaining that the character of stolons or turions, æstival or autumnal, is not absolute in the genus *Epilobium*. This is a much more important question than whether England has in its Flora one more doubtfully distinct species. I commence on it by abstracting the diagnostic characters given by the leading authors for these forms. J. Gay, in his printed but unpublished account of *E. Duriæi*, diagnoses the species as follows, *inter alia*:—"Radix stolonifera; caule stricto, simplici tereti, pubescente, foliis rudimentalibus imbricatis basi quasi squamato; foliis inferioribus oppositis sessilibusque, superioribus quandoque alternis et petiolulatis."

In the accompanying description, J. Gay says *E. Duriæi* differs from *E. montanum*, "statura dimidio minore, 5–10-unciali; caule simplici non ramoso; radicis collo stolonifero; foliis inferioribus sessilibus non petiolulatis; petalis majoribus (4 lin. longis) saturate violaceis, non roseis carneisve." Also J. Gay repeats in conclusion the character that the kataphylloid leaves persist during flowering the succeeding year, whereas the stem of *E. montanum* is ascending naked at base (at that time). I need only remark on all this that it applies most accurately to J. Gay's own material, and equally well to much of my Andover plant, but that I have from the same Hampshire locality very numerous specimens that do not agree, and which appear to me to offer a complete transition to typical *E. montanum*.

Mons. Barbey figures the type of J. Gay, and quotes his characters; but does not say how the plant differs from *E. montanum*, nor does he express any opinion as to its specific distinctness therefrom.

Nyman, Consp. Fl. Europ. pp. 247, 248, diagnoses the species as follows:—

† Hybernaculum e geminis autumnalibus sessilibus vel subsessilibus constans.

E. MONTANUM L.

†† Hybernaculum e stolonibus æstivalibus (synanthiis).

E. DURIÆI J. Gay = *F. silvaticum* Boreau, Suppl. 47.

On this I remark, in the typical English *E. montanum* there are no stolons under the ground in summer; in autumn, broad dense rosettes with green recurved leaves are formed just above the ground. Such can be well seen in Hewett Watson's herbarium, but it is an extreme form, and, in my experience, a very rare form. In the hundreds of *E. montanum* which I dug up last *summer*,

especially those growing in rotten leaves in woods, hypogæous elongate stolons, usually 2 mm. in diam. (excluding the kataphylloid leaves), were generally found (Tab. 307, fig. 3), even in some young plants 4–6 in. high before they had come into flower. The form *E. sylvaticum* Boreau, as authenticated by Haussknecht in Herb. Kew (but considered by him, Monogr. *Epilobium*, p. 77, identical with the Linnean *E. montanum*), is (I should say) commoner in England than the type form with autumn rosettes. I do not see any tangible difference, indeed, between this specimen *E. sylvaticum* (i. e., *montanum* L.), authenticated by Haussknecht, and J. Gay's original *E. Duriæi* (i. e. Durieu n. 343). But let us get on to Haussknecht's *characters* (in Monogr. *Epilobium*). In his disposition of the species, p. 35, *E. montanum* and *E. Duriæi* are put in two different main groups. We have—

"A. TURIONIFERÆ: turiones ab initio hypogæi, brevi postea epigæi, foliis innovatoriis carnosis crassis pallidis squamiformibus quadrifariam imbricatis, vel turiones ab initio epigæi foliis innovatoriis majoribus recurvatis viridescentibus, rarius casu soboliformes foliis innovatoriis subremotis.—E. MONTANUM."

"B. SOBOLIFERÆ: soboles hypogæi internodiis elongatis. — E. DURIÆI."

I cannot sort my specimens by this diagnosis; I cannot tell whether the turions are "lusu soboliformes" or true "soboles." As to the length of the internodes, it depends on age—even the typical green turions (rosettes) grow out at last. In the typical *E. Duriæi* (Durieu n. 343) one specimen has the internodes of the stolons elongate, the other specimen not. All my material similarly varies. No doubt the rosette autumn turiones of *E. montanum* typ. do not produce elongate shoots, "internodiis elongatis," till the next spring; but Haussknecht himself places as identical (not as a var., or even as a hybrid) the example of *E. sylvaticum* Boreau, which has linear soboles, with internodes ¼ in. long *in August*.

Haussknecht has felt this, and on the next page (p. 36) he gives an additional "disposition for the determination of the European Epilobiums." In this we have—

a. *Semina oblonga apice m. m. attenuata pellucido appendiculata.*
E. DURIÆI J. Gay. Hausskn. Epilob. t. 1, fig. 26.

b. *Semina obovoidea apice rotundata.*
E. MONTANUM L. Hausskn. Epilob. t. 1, fig. 19.

On this I remark that I have put under the microscope seeds of Durieu n. 343, right-hand specimen, and that they are exactly as figured by Barbey t. 14, *i. e.*, much more like Hausskn. t. 1, fig. 19, than his t. 2, fig. 26. But I do not impugn Haussknecht's accuracy for a moment; in my Andover *E. Duriæi*, I have found seeds closely agreeing with Hausskn. t. 2, fig. 26. In other words, I do not believe that a species of *Epilobium* can stand firm on such small differences in the seed. I have examined a great many *Epilobium* seeds, and do not deny the great value of the characters to be drawn from the seed. But, as far as my examination goes, I cannot distinguish *E. Duriæi* from *E. montanum* by the seed. As

to the full description of *E. Duriæi* by Haussknecht (*Epilobium*, p. 95), it appears to be a "photograph" of the right-hand specimen of Durieu n. 343, but not to cover the left-hand specimen nor much of J. Gay's material.

I have devoted several days to digging *E. montanum* (in the broad sense) this year, before expressing any opinion as to the validity of Haussknecht's species; his varieties and hybrids are altogether bepond me. I have found a very great variety in the stolons of *E. montanum*, while yet they are different always from those of closely allied (admitted) English species. I frequently found that the "stolons," even before ¼ in. long, throw long roots from the axils of the first kataphylloid leaves; such stolons of course detach themselves before autumn comes (Tab. 307, fig. 2). They are generally so easily detachable that, unless the plant is dug up with great care, they are all left behind. This may explain why no author mentions them. Where *E. montanum* grows in ditches full of leaves in woods, I found the loose leaf-mould full of these detached new plants, even in August.

In order to keep this note within moderate compass, I have not brought into discussion some closely-allied forms, as *E. collinum* Gmel.; this in its branched habit and leaves differs (as to the Kew bundle) a good deal; but Haussknecht has marked John Stuart Mill's *E. Duriæi* (gathered by him on Mont Dore) as *E. collinum* Gmel.; this example has the simple short stem, the persistent kataphylloid leaves, the stolons (soboles) exactly as in J. Gay's *E. Duriæi*; the plants are young, so that Haussknecht could not have tried a seed. In fine, whether *E. Duriæi* and *E. collinum* are species, or only forms, it appears to me that J. S. Mill was right.

I am indebted to Mr. N. E. Brown for making the drawings on Plate 307 to illustrate the points in this paper. I have so great trust in Mr. Brown's acuteness for discriminating *small* differences, that I feel much strengthened in my views when he finds *E. Duriæi* of J. Gay undistinguishable from my Hampshire *E. Duriæi*.

DESCRIPTION OF PLATE 307.—Fig. 1. *Epilobium Duriæi* J. Gay, *viz.*, Durieu n. 343, from Puerto de Leitariegos, 17th July, 1835; *left-hand example*, nat. size, base and summit of stem: the middle piece of stem omitted is 2 in., with 4 pairs of leaves; above is shown a sepal, magnified 4 times. 2. Collected at Ashstead, Surrey, 31st Aug. 1890, are stolons (very white) already detached, in rotten leaves. 3. *E. montanum* L., collected at Ashstead, Surrey, 31st Aug. 1890, growing in gravel; a young plant, that has not yet flowered, yet producing stolons. 4. *E. Duriæi* J. Gay, *viz.*, C. B. Clarke n. 47327 A, collected at Chute, Andover, 15th July, 189.; the base of stem, leaves, and flower shown nat. size; the detached sepal, magnified 4 times, for comparison with fig. 1. 5. The base of three stems, C. B. Clarke n. 47656, collected at Chute, Andover, 18th Sept. 1890; of these, A may be called *E. Duriæi*, B is exceedingly like *E. sylvaticum* (Haussknecht's type), and C is the commonest (with me) form of *E. montanum*; the three plants grew together with a large number of similar and intermediate (if possible) forms.

THE ALGÆ OF THE CLYDE SEA AREA.

(Continued from p. 214.)

Series CHLOROPHYCEÆ.

Cohort Protococcinæ.

Order Protococcaceæ.

Tribe Endosphæreæ.

*Chlorochytrium Cohn.

C.? inclusum Kjellm. In vol. iv. of the *Natural History Review* Prof. Harvey described a specimen of *Cruoria* sent to him from "Kilcraggan," opposite Gourock," by Dr. Walker Arnott, "the remarkable character" of which "consists in the fructification, which is a large terminal pyriform green! spore, surrounded by a wide gelatinous limbus." There is a slide of a similar specimen from Cumbrae in Mrs. Robertson's cabinet, and this "green spore" turns out to be an endophytic alga, almost certainly Kjellmann's *C. inclusum*.

Cohort Confervinæ.

Order Blastosporaceæ.

*Prasiola (Ag.) Jessen.

**P. stipitata* Suhr. = *P. marina* Crn. Dunoon! E. M. Holmes.

Order Ulvaceæ.

*Pringsheimia Rke.

**P. scutata* Rke. On a specimen of *Rhodochorton Rothii* Näg., from Cumbrae, in Mrs. D. Robertson's collection.

Monostroma Thur.

M. Grevillei Wittr. = *Ulva lactuca* Phyc. Brit. "Frequent, Cumbrae," M. Bute! Herb. Shuttleworth in Brit. Mus. Ardrossan, Herb. Kew.

Diplonema Kjellm.

D. confervoides Holm. et Batt. = *Enteromorpha percursa* Phyc. Brit. Wemyss Bay! Herb. Grev. Bute! M.

Enteromorpha Link.

**E. clathrata* J. Ag. "Arran," Landsborough. Cumbrae! Fairlie Buoy! D. R.

E. erecta J. Ag. Cumbrae! D. R.

E. ramulosa Hook. Cumbrae! D. R.

E. compressa Grev. Cumbrae! D. R. Largs! Herb. Lyon, Brit. Mus. "Arran," Landsborough.

E. Linza J. Ag. Innellan! T. King.

E. intestinalis Link. Cumbrae! D. R. Innellan! T. King.

**E. Linkiana* Grev. Cumbrae! D. R.

Ulva L.

U. lactuca Le Jol. = *U. latissima* Phyc. Brit. Cumbrae! D. R. Innellan! T. King. "Common," M.

Order Cladophoraceæ.

Urospora Aresch.

U. penicilliformis Aresch. = *Conferva Youngana* Phyc. Brit. Greenock! "On a small buoy, Cumbrae!" D. R. et Arnott in Herb. Brit. Mus.

U. flacca Holm. et Batt. = *Lyngbya flacca* et *L. Carmichaelii* Phyc. Brit. Cumbrae! D. R.

U. speciosa Holm. et Batt. "Arran," M.

Chætomorpha Kütz.

C. melagonium Kütz. = *Conferva melagonium* Phyc. Brit. "Corriegills, Arran," M. Cumbrae! D. R.

C. ærea Kütz. = *Conferva* Phyc. Brit. "Ailsa," M. Cumbrae! D. R.

C. litorea Holm. et Batt. = *Conferva* Phyc. Brit. "Common," M. (*C. linum* Landsborough's "Arran").

Rhizoclonium Kütz.

R. tortuosum Kütz. = *Conferva tortuosa* Phyc. Brit.? Cumbrae! D. R. "Arran," Landsb. "Bute!" Herb. Grev. In the *Revised List of British Marine Algæ*, by Mr. Holmes and myself, *Conferva tortuosa* Phyc. Brit. is referred to *Chætomorpha tortuosa* Kütz.; but the specimen labelled "*Conferva tortuosa*. Cumbrae" in Mrs. Robertson's collection is undoubtedly a *Rhizoclonium* with filaments 35–56 μ broad, thus fully agreeing with Kützing's *R. tortuosum* as understood by Farlow, Foslie, and others.

R. riparium Harv. Cumbrae! D. R. "Arran," Landsborough. Bute! Cutler; Brit. Mus.

R. implexum Kutz. = *Conferva implexa* Phyc. Brit. Largs Pier! J. G. in Herb. Robertson. "Bute, rare," M.

Foslie,* while adopting the name *Rhizoclonium rigidum*, has shown that Gobi's plant is identical with the *Conferva implexa* of Wyatt's Alg. Danm. et Phyc. Brit., but, according to the recognised rules of nomenclature, he should have used the specific name "*implexum*," which has the priority of publication by nearly seventy years. In our *Revised List* Mr. Holmes and I have given *C. implexa* as a synonym of *R. tortuosum*, at the same time retaining Gobi's name *R. rigidum* for a plant found at Berwick. I am now of opinion that we ought to have given *R. rigidum* as a synonym of *R. implexum* = *C. implexa*.

The specimen of this species in Mrs. Robertson's collection has the filaments 12–25 μ in breadth, thus agreeing very closely with both Foslie's Norwegian (18–25 μ) and Major Reinbold's Baltic (12–20 μ) specimens.

**R. Kochianum* Kütz. Cumbrae! mixed with *Enteromorpha clathrata*, Hennedy in Herb. Robertson. When examining under the microscope a specimon from Cumbrae, labelled in Mr. Hennedy's handwriting, "*Enteromorpha ramulosa* in its old state. Cumbrae, June 28th, '61," I was delighted to find a quantity of this very slender *Rhizoclonium* mixed with the *Enteromorpha*. The filaments of the Cumbrae specimen were only 9–10 μ broad.

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* *Contribution to the Knowledge of the Marine Algæ of Norway*, p. 140.

CLADOPHORA Kütz.

*C. *pellucida* Kutz. Cumbrae! D. R.

*C. *Hutchinsiæ* Harv. Cumbrae! D. R. Ardrossan. Saltcoats! Herb. Brit. Mus.

*C. *utriculosa* Kütz. β. *lætevirens* Hauck. = *C. lætevirens* Phyc. Brit. Cumbrae! D. R. Ardrossan! Herb. Brit. Mus.

*C. *rupestris* Kutz. Cumbrae! D. R. Innellan! T. King. Ailsa Craig! D. R.

*C. *glaucescens* Harv. Cumbrae! D. R.

*C. *rectangularis* Harv., f. *subnuda* Kütz. Cumbrae! D. R.

*C. *fracta* Kütz. "Arran," M.

*C. *flavescens* Kütz. "Arran," M.

*C. *albida* Kütz. "Arran," M.

*C. *albida* f. *refracta* Thur. = *C. refracta* Phyc. Brit. "Cumbrae," M.

*C. *Balliana* Harv. "Ailsa," M.

*C. *arcta* Kütz. Cumbrae! D. R. Kildonan! T. King. Ardrossan! Herb. Lyon, Brit. Mus.

*C. *lanosa* Kütz. "Ardrossan!" Herb. Lyon. Bute! Herb. Grev. "Arran," Landsb.

*C. *lanosa* f. *uncialis* Thur. = *Clad. uncialis* Phyc. Brit. Cumbrae! D. R.

Cohort SIPHONINÆ.

Order BRYOPSIDACEÆ.

BRYOPSIS Lam.

*B. *hypnoides* Lam. Saltcoats! Herb. Brit. Mus.

*B. *plumosa* Lam. Cumbrae! Miss Barton. Arran, Landsb. Common, M.

Order VAUCHERIACEÆ.

VAUCHERIA DC.

*? *V. Thuretii* Woron. = *V. velutina* Phyc. Brit. Near Largs, Herb. Cutler. Common, M.

Order CODIACEÆ.

CODIUM Stackh.

*C. *tomentosum* Stackh. Cumbrae, D. R. Kildonan! T. King. Girvan! D. R.

SERIES PHÆOPHYCEÆ.

Cohort ECTOCARPINÆ.

Order DESMARESTIACEÆ.

DESMARESTIA Lam.

*D. *viridis* Lam. Cumbrae! D. R. "Arran," Landsb. Brodick, M.

*D. *aculeata* Lam. Toward! T. King. Cumbrae! D. R. Campbletown and Largs, Herb. Brit. Mus. Arran, Landsb. Gourrock, M. Ardrossan, Herb. Kew.

*D. *ligulata* Lam. Campbletown, M.

Order DICTYOSIPHONACEÆ.

DICTYOSIPHON Grev.

*D. *fæniculaceus* Grev. Fairlie! D. R. Bute, Herb. Brit. Mus. Arran, Landsb. Common, M.

*D. *hippuroides* Aresch. "Firth of Clyde!" Exact locality not stated. Herb. T. King.

Order Punctariaceæ.

Litosiphon Harv.

L. pusillus Harv. Cumbrae! D. R. Arran, Landsb.

L. Laminariæ Harv. Cumbrae! D. R. Bute! D. R.

*Stictyosiphon Kütz.

S. Griffithsianus Holm. et Batt. = *Ectocarpus brachiatus* Phyc. Brit. Wemyss Bay! D. R. Millport, Cumbrae, M. Ardrossan. Rev. Dr. Landsborough. Johnstone & Croall, iii. p. 193.

**S. subarticulatus* Hauck. Kildonan, J. Cook. Holmes in *Grevillea*, vol. x. p. 140.

**S. tortilis* Rke. Kildonan. Herb. Landsborough. Holmes in *Grevillea*, vol. x. p. 141.

Striaria Grev.

S. attenuata Grev. Cumbrae! D. R. Bute! Brit. Mus. Arran, M.

S. fragilis J. Ag. Cumbrae. Rare, M. This species is quite unknown to me.

*Desmotrichum Kütz.

**D. undulatum* Rke. Bute! Herb. Grev.

Punctaria Grev.

P. plantaginea Grev. Cumbrae! D. R. Arran, Landsb. Saltcoats! Herb. Brit. Mus.

P. latifolia Grev. Rare. Arran, Landsb.

P. latifolia f. *zosteræ* Le Jol. = *P. tenuissima* Phyc. Brit. Cumbrae! D. R. Isle of Bute! Herb. Grev. et Brit. Mus. Hunterston Buoy! D. R.

Order Asperococcaceæ.

Myriotrichia Harv.

M. clavæformis Harv. Cumbrae, M.

M. clavæformis f. *filiformis* Farlow. Cumbrae! D. R.

Asperococcus Lam.

A. echinatus Grev. Cumbrae! D. R. Island of Inch. Ardrossan, Herb. Brit. Mus. Arran, Landsb.

A. bullosus Lam. = *A. Turneri* Phyc. Brit. Cumbrae! D. R. Loch Ranza, M. "Arran!" Herb. Brit. Mus.

Order Ectocarpaceæ.

Ectocarpus Lyngb.

**E. terminalis* Kütz. In Mrs. Robertson's collection there is a specimen of this species labelled "*E. pusillus*. Cumbrae, Aug. '61." It is a little more robust than usually is the case, the measurement being:—Filaments 1–1·5 mm. long, 10–18 μ broad; plurilocular sporangia 30–60 μ long by 20–40 μ broad.

E. pusillus Griff. Rare. Tan Buoy, M.

E. confervoides Le Jol. = *E. siliculosus* Phyc. Brit. Bute! Herb. Brit. Mus. Arran, Landsb.

E. fasciculatus Harv. Cumbrae! D. R. Toward, M.

E. granulosus Ag. Cumbrae! D. R. & Miss Barton.

E. granulosus f. *tessellata* Harv. Cumbrae! D. R. Common, M.

E. Hincksiæ Harv. Cumbrae! D. R.

E. tomentosus Lyngb. Little Cumbrae! D. R. Bute, Grev. in Herb. Cutler. Arran, M.

E. crinitus Carm. Cumbrae! D. R. The specimens of this species in Mrs. Robertson's collection are sterile, but appear correctly named.

E. Landsburgii Harv. Cumbrae! D. R. Fintry Bay! Largs! Arnott in Herb. Grev. Arran, M.

E. distortus Carm. Cumbrae! D. R. Arran, Arnott in Herb. Grev.

*Sorocarpus Pringsh.

S. uvæformis Pringsh. In Miss Gifford's collection there is a specimen of this species labelled "*Ect.* ——*?* Cumbrae, 3.53. A very strange species, which I cannot yet refer. "It grows in Cumbrae, and also near Gourock, in the Clyde. W. Arnott." It thus appears that Dr. Walker Arnott was the first person who found this interesting plant in Britain.

Isthmoplea Kjellm.

I. sphærophora Kjellm. = *Ectocarpus sphærophorus* Phyc. Brit. Cumbrae! D. R. et Arnott in Herb. Brit. Mus. Arran, M.

Pylaiella Bory.

P. litoralis Kjellm. = *Ectocarpus litoralis* Phyc. Brit. Arran, M. Cumbrae! Ayrshire, Herb. Brit. Mus.

Order Arthrocladiaceæ.

Arthrocladia Duby.

A. villosa Duby. Common, M. "Cumbrae," Major Martin Johnstone & Croall, iii. p. 37.

Order Elachistaceæ.

Elachista Duby.

E. Grevillei Arn. Largs, Greville. Corriegills. Arran, Arnott. Fintry Bay, M.

E. fucicola Fries. Cumbrae! D. R. Arran, Landsb.

E. stellulata Griff. Frequent. Cumbrae, M.

Order Sphacelariaceæ.

Sphacelaria Lyngb.

S. olivacea Pringsh. = *S. radicans* Phyc. Brit. Cumbrae! D. R. Ardrossan! Herb. Brit. Mus. Arran, Landsb.

S. racemosa Grev. Cumbrae! Hennedy. Arran, M. The specimens labelled *S. racemosa* in Mrs. Robertson's collection are sterile, and appear to me to belong rather to *S. olivacea* than to the present species; but it is almost impossible to form a correct opinion in the absence of reproductive organs.

S. cirrhosa Ag. Cumbrae! D. R. Girvan! D. R. Kildonan! T. King. Arran, Landsb. Ailsa, M.

S. cirrhosa β. ægagophila Ag. Cumbrae! D. R. Bute, Grev. Crypt. Flora, p. 317.

S. cirrhosa ε. patentissima Grev. Bute, Grev. Crypt. Fl. p. 317.

CHÆTOPTERIS Kütz.

C. plumosa Kütz. = *Sphacelaria plumosa* of Mahoney's List. Ardrossan! Rev. D. Landsborough. Cumbrae! D. R. Killbride! Ayrshire, Herb. Brit. Mus.

CLADOSTEPHUS Ag.

C. spongiosus Ag. Ayr Heads! D. R. Loch Ranza! D. R. Saltcoats, Herb. Brit. Mus. Common, M.

C. verticillatus Ag. Cumbrae! D. R. Kildonan! T. King. Girvan! D. R.

STYPOCAULON Kütz.

S. scoparium Kütz. Cumbrae! D. R. Arran, Landsb. "Common," M.

Order MYRIONEMIACEÆ.

MYRIONEMA Grev.

M. strangulans Grev. Cumbrae! Epiphytic on *Enteromorpha compressa*! D. R. On *Dumontia*, Herb. Brit. Mus.

ASCOCYCLUS Magn.

A. Leclancherii Rke. = *Myrionema Lechlancherii* Phyc. Brit. Loch Striven, M.

RALFSIA Berk.

R. verrucosa. Cumbrae! D. R. Arnott in Herb. Brit. Mus.

Order CHORDARIACEÆ.

SPERMATOCHNUS Kütz.

S. paradoxus Kütz. = *Stilophora Lyngbyei* Phyc. Brit. Invercloy, Arran; Arnott in Herb. Brit. Mus. Cumbrae, M. Arran, Landsb.

STILOPHORA J. Ag.

S. rhizoides J. Ag. Rothesay, Rev. G. Laing. Cumbrae! D. R. Arran, M. "Lamlash," Major Martin, Johnstone & Croall, iii. p. 83.

CHORDARIA Ag.

C. flagelliformis Ag. Campbletown! Herb. Brit. Mus. Dunoon! T. King. Cumbrae, M.

MESOGLOEA Ag.

M. vermiculata Le Jol. = *M. vermicularis* Phyc. Brit. Dunoon! T. King. Arran, Landsb. Ailsa, M.

**M. lanosa* Crn. Cumbrae! D. R.

CASTAGNEA Derb. & Sol.

C. virescens Thur. = *Mesogloea virescens* Phyc. Brit. Cumbrae! D. R. Saltcoats, Herb. Brit. Mus. Loch Ranza, M. Arran, Landsb.

LEATHESIA Gray.

L. difformis Aresch. = *L. tuberiformis* Phyc. Brit. Cumbrae! D. R. "Common," M.

L. crispa Harv. Cumbrae!. Arnott in Herb. Brit. Mus.

Cohort Laminarinæ.

Order Scytosiphonaceæ.

Phyllitis Kütz.

P. fascia Kütz. = *Laminaria fascia* Phyc. Brit. Cumbrae! D. R. Arran, Landsb. Common, M.

Scytosiphon Ag.

S. lomentarius J. Ag. = *Chorda lomentaria* Phyc. Brit. Cumbrae! D. R. Bute, Herb. Brit. Mus. Kildonan! T. King.

Order Chordaceæ.

Chorda Stackh.

C. filum Stackh. Innellan! T. King. Arran, Landsb. "Common," M. Cumbrae! D. R.

**C. tomentosa* Lyngb. Cumbrae! D. R.

Order Laminariaceæ.

Laminaria Lamour.

L. saccharina Lam. Cumbrae! D. R. Innellan! T. King. Arran, Landsb.

L. saccharina f. *phyllitis* Le Jol. = *L. phyllitis* Phyc. Brit. Cumbrae! D. R. Ardrossan, Herb. Hooker, Kew.

L. digitata Edm. Arran, Landsb. "Common," M.

Saccorhiza De la Pyl.

S. bulbosa De la Pyl. = *Laminaria bulbosa* Phyc. Brit. Cumbrae! D. R. Arran, Landsb. Common, M. Ayrshire, Herb. Kew.

Alaria Grev.

A. esculenta Grev. Cumbrae! D. R. Kildonan! T. King. Arran, Landsb. Saltcoats, Herb. Brit. Mus.

Cohort Sporochninæ.

Order Sporochnaceæ.

Sporochnus Ag.

S. pedunculatus Ag. Cumbrae! D. R. Lamlash Bay, Arran, Major Martin, Johnstone & Croall, iii. p. 39.

Cohort Cutlerinæ.

Order Cutleriaceæ.

Aglaozonia Zan.

A. reptans Kütz. = *Zonaria parvula* Phyc. Brit. Cumbrae, Landsb. Brodick, M.

Cutleria Grev.

C. multifida Grev. Cumbrae! D. R. Bute! D. R. Loch Ranza, M. "Lamlash Bay, Arran, Major Martin," Johnstone & Croall, iii. p. 67.

Cohort Fucinæ.

Order Fucaceæ.

Fucus L.

F. ceranoides L. Cumbrae! D. R. Bute, Herb. Brit. Mus. Arran, Landsb. Greenock, M. Araan, Herb. Kew.

F. vesiculosus L. Innellan! T. King. "Clyde," Herb. Brit. Mus. Common, M. Arran, Herb. Kew.

F. vesiculosus f. *laterifructa* Grev. Bute! Herb. Shuttleworth, Brit. Mus. (Grev. Crypt. Fl. p. 319).

F. vesiculosus f. *baltica* J. Ag. = f. *subecostata*. Arran! & Bute! Herb. Brit. Mus. Cumbrae! M.

F. serratus L. Innellan! T. King. Gourock, Herb. Lyon, Brit. Mus. Arran, Landsb. Bute, Herb. Hooker, Kew.

**F. serratus* f. *latifolia* Turn. Isle of Bute! Herb. Mrs. Robinson, Brit. Mus.

ASCOPHYLLUM Stack.

A. nodosum Le Jol. = *Fucus nodosus* Phyc. Brit. Arran, Landsb. "Clyde," Herb. Lyon, Brit. Mus. Common, M.

PELVETIA Dcne. et Thur.

P. canaliculata Dcne. et Thur. = *Fucus canaliculatus* Phyc. Brit. Innellan! T. King. Arran, Landsb. Common, M.

BIFURCARIA Stackh.

B. tuberculata Stackh. Arran, rare, M.

HIMANTHALIA Lyngb.

H. lorea Lyngb. Cumbrae! D. R. Lamlash, Arran, Landsb.

CYSTOSEIRA Ag.

C. ericoides Ag. Cumbrae! D. R. Macrehanish Bay, M. Heads of Ayr, Herb. Borrer, Kew.

Cohort TILOPTERIDINÆ.

Order TILOPTERIDACEÆ.

TILOPTERIS Kütz.

T. Mertensii Kütz. = *Ectocarpus Mertensii* Phyc. Brit. Cumbrae! dredged in 4 fathoms, D. R. Toward, M. Gourock, Herb. Kew.

Cohort DICTYOTINÆ.

Order DICTYOTACEÆ.

DICTYOTA Lam.

D. dichotoma Lam. Cumbrae! & Ayr Heads! D. R. Kildonan! D. Gregorson in Herb. King. Arran, Landsb.

D. dichotoma f. *implexa* J. Ag. = f. *intricata* Phyc. Brit. Rare. Cloch, M.

(To be continued.)

THE BOTANY OF THE SNARES.

By T. KIRK, F.L.S.

(Concluded from p. 208.)

Lepidium oleraceum Forst. ("Cook's scurvy-grass") was found in one or two places on the cliffs, associated with *Myosotis capitata* var. *albida*, a form not infrequent on the cliffs of Stewart Island.

The only ferns collected were *Lomaria dura* Moore, *Asplenium*

obtusatum Forster, and *Aspidium aculeatum* Swartz, var. *vestitum*. It had long been thought possible that tree-ferns might extend to the Snares, but none were observed. The extreme southern limit of tree-ferns therefore is the South Cape of Stewart Island, in S. latitude 47° 20′, instead of 45° 50′, as usually stated in our text-books.

A few naturalised plants have been introduced by the sealers, and four or five indigenous species from the mainland have become established in the Snares by the same agency.

The total number of Phanerogams and Ferns observed in the island was under thirty, but my visit was too brief to allow of an exhaustive examination being made; it is not probable that any large number of species will be added.

Mosses are exceptionally rare; a few Lichens were observed, but no Fungi or Hepaticæ. No opportunity of collecting Marine Algæ was afforded.

I append a description of the more remarkable species:—

Ligusticum acutifolium, sp. n.—A stout herb 3–5 ft. high, rootstock as thick as a man's wrist. Leaves 2 ft. long or more, 6″–9″ broad, oblong or ovate-oblong, tripinnate; segments large, acute; petiole with the upper part of the sheath free, forming a ligule. Stem stout, much branched; flowers not seen. Fruiting umbels 2″ 2½″ diameter, compound, dense; carpels $\frac{3}{16}$″ long, exceeding the pedicels, 3–5-ribbed.

Hab. The Snares.

A handsome species, allied to *L. intermedium* Hook. f. and *L. Lyallii* Hook. f., but distinguished from the former by the ligulate petiole, acute segments, smaller umbels, and shorter fruits; from the latter by the broad segments of the leaves and broad ligulate petiolate sheath; and from both alike by the absence of viscid, milky juice. The sheathing bracts are leafy at the tips and unusually large, sometimes exceeding the flowering branches.

Aralia Lyallii T. Kirk, var. robusta.—More robust and less hispid than the type. Stolons absent. Petioles flat above, convex below, solid or nearly so; teeth more strongly mucronate. Flowers smaller, petals shorter, dull yellow.

Hab. The Snares.

The typical plant, which is found on Stewart Island and islands in Foveaux Strait, has softer and more hairy foliage; terete, thin-walled, fistulose petioles; lurid, purple flowers; stout stolons as thick as a man's finger, and which are at first erect. No difference is presented in the form of the leaves, the curious tubular ligule at the base of the petiole, nor in the structure of the fruit.

Deschampsia gracillima, sp. n.—An erect, tufted, glabrous species. Culm very slender, 2″–5″ high; leaves involute, narrow almost filiform, sheaths slightly inflated; ligule entire or lacerate. Panicle ¾″–2″ long, open; branches few, capillary; spikelets few, 2-flowered; outer glumes unequal, 5-nerved; flowering glumes with a pencil of hairs at the base, ovate, truncate, minutely 3–5-toothed, or else with a short dorsal awn inserted just below the apex; paler, minutely ciliated; rachilla silky; ladicules 3; grain free.

Hab. Carnley Harbour, Auckland Islands, 1000 ft., *T. Kirk.*

The flowering glumes in some instances are deeply and evenly toothed, in others the teeth are shallow, or the margin is merely erose. The lower flower is sessile within the outer glumes; the upper is carried on a short stipe, which is invariably silky. The grain is very large for the size of the flower.

Deschampsia Hookeri mihi. — *Catabrosa antarctica* Hook. f. Fl. Antarc. i. 102, t. 56; Fl. N. Z. i. 308; Handbook N. Z. Fl. 336; J. Buchanan, Indig. Grasses of N. Z., t. 41. *Triodia*, Benth. and Hook. f. Gen. Pl. iii. 1176.

Mr. N. E. Brown having referred this plant to *Deschampsia* Pal., in the Kew Herbarium, a new specific name is rendered necessary, the one which it bears as a *Catabrosa* having been appropriated to a Chilian species, *Aira antarctica* Hook. f., which has been removed to *Deschampsia* by M. Desvaux. No name can be more appropriate than that of its original disoverer.

Culms very slender, erect or decumbent, 3″–18″ high. Leaves involute, narrow or almost filiform, longer or shorter than the culms; sheaths slightly inflated, grooved; ligule very long and narrow. Panicle very slender, 2″–8″ long, contracted or effuse; branches capillary, often trichotomous; spikelets few, pedicillate, glistening, 2-flowered; outer gls. unequal, obscurely 3-nerved; flowering gl. ovate, truncate, minutely toothed or erose, obscurely 5-nerved, with a short dorsal awn inserted immediately beneath the apex or 0, or with the median nerve excurrent; palea equalling the flowering gl.; rachilla glabrous or silky, often reduced to a mere point. Ladicules 3. Anthers very short and broad. Grain free.

a. The larger outer glume equalling the lowest flower; pedicel of upper fl. glabrous or with a few short hairs; awn present or 0; rachilla glabrous when present.

b. The larger outer glume half the length of the lowest flower; pedicel of upper flower silky; awn usually present; rachilla silky.

Hab. Central mountain range of the north and south islands. Antipodes Island. Auckland Islands. Campbell Island. Sea level to 5000 ft. Also in Chili.

This plant affords an instance of the difficulty attending the limitation of the genera of Grasses, on account of the distinctive characters being chiefly drawn from organs usually considered to be of but secondary importance. In some states all the spikelets are perfectly awnless; in others the awn is represented by the short, excurrent, median nerve of the flowering glume alone, and when present is never inserted below the middle of the glume; all characters in which it diverges from the typical form of *Deschampsia*. In some instances the truncate flowering glume is minutely but distinctly 3-toothed, as in *Triodia* Br., to which it is referred by the learned authors of the *Genera Plantarum*; in others it is rather waved at the margin than erose, with or without a minute projection of the median nerve, and in this state may well be referred to *Catabrosa* Beauv., in which it was originally placed by its discoverer, who evidently observed the close general resemblance of the flowers to those of *Deschampsia*.

It varies considerably in habit and stature, but in the fruiting state the leaves are shorter than the culms, the panicle is usually effuse, and the capillary branches rigid. Two forms are easily distinguished by the relative lengths of the lowest flower and the larger outer glume, as stated above; the awn is usually situate just below the apex of the flowering glume, and sometimes does not project beyond it, or but very slightly, when it is liable to be mistaken for a prolongation of the median nerve; in most cases, however, it is well developed and unmistakable, but it is rarely situate below the upper third of the glume and never below the middle. In some panicles the upper flower is invariably awned and the lower awnless; but panicles from the same plants vary greatly in this respect. Another variable character is found in the rachilla, which, in the form with small outer glume, is always present and very silky, but is often wanting in the form with a large outer glume, and when present is usually glabrous. A similar variation is seen in the pedicel of the upper flower, and in the presence or absence of a small panicle of silky hairs at the base of either flower. The grain is very large for the size of the flower.

I have for some years past distributed specimens of an elegant form of this plant, with an elongated panicle and glumes of a faint purplish hue, under the name of *Triodia antarctica* Benth. and Hook. f., var. *purpurea;* and Mr. Petrie informs me that he has described a similar plant, under the name of *Deschampsia Chapmanii*, but I have not seen his description.

NOTES ON SOME OF THE *RUBI* AND *ROSÆ* OF THE YORKSHIRE DALES.

By Rev. W. Moyle Rogers, F.L.S.

All last August and half of September were spent by me in the Yorkshire Dales, where I made it my special object to study the *Rubi* and *Rosæ* of the district. I had the constant assistance of my son, F. A. Rogers, and with him explored a good deal of country—from the Helmsley and Northallerton neighbourhoods in North-East Yorks, through parts of Swaledale and Wensleydale in North-West Yorks, to the Settle neighbourhood in Mid-West Yorks. Bad weather spoilt a good many of our expeditions; but there were few days in the six weeks in which we did not do some steady work, and so I was not wholly disappointed in my hope of getting a fair idea of what that part of Yorkshire could produce. The results were especially interesting to me as a south country botanist. Keeping for the most part on rather high ground, and on "mountain limestone" and other formations mostly unfavourable to *Rubi*, I naturally missed altogether many of the plants with which I am familiar in S.W. England; and while most of those I found were common to north and south, I had the pleasure of seeing a few

others either previously known only from herbarium specimens, or altogether new to me. For help in determining these last I am indebted to Prof. Babington and Dr. Focke. *Rosæ* were usually much more fully represented than *Rubi*, and (I need hardly add) were far more generally northern in character.

In these notes, N.E.Y. stands for North-East Yorks (62, Top. Bot.), N.W.Y. for North-West Yorks (65), and M.W.Y. for Mid-West Yorks (64). An asterisk will be found prefixed to these initial letters when the plant has not (so far as I know) been previously recorded for the vice-county which they represent.

Rubus Idæus L. Pretty generally distributed, and often very abundant.

I saw no *Suberecti*.

R. Lindleianus Lees. N.E.Y. Nunnington. N.W.Y. Near Richmond, bushy hill-side two miles on the Reeth Road. In both localities quite typical, and in good quantity.

R. Lindebergii P. J. Müll. *N.E.Y. Near Helmsley. Rievaulx. Nunnington. *N.W.Y. Near Richmond and Catterick Bridge. In Wensleydale in great quantity, especially at Aysgarth. Askrigg, above Mill Gill Foss. *M.W.Y. Giggleswick and Stainsforth, in plenty. Named by Dr. Focke, and agreeing exactly with Scandinavian specimens. Prof. Babington also assents. One of the most characteristic brambles of the Dales, where it takes the place of south country *rhamnifolius* and ordinary "*umbrosus*"—being easily distinguished from both by its long narrow panicle with short crowded branches, and falcate or declining yellowish prickles; its uniformly narrow obovate-acuminate leaflets, greyish green above, and greenish-white felted beneath; and its large narrowly obovate petals, which seem always white. I have seen it also in Derbyshire. Tall high-arching plants, especially abundant in open sunny spots.

R. pulcherrimus Neuman (*R. polyanthemos* Lindeb.). *N.E.Y. Nunnington and Rievaulx. Confirmed by Dr. Focke as "true *pulcherrimus*" (for his reasons for preferring this name to *polyanthemos*, see Journ. Bot. 1890, p. 166), and identical with Dorset plants so named by him, and with others that I have seen in the New Forest. In all these localities it is much less strongly arching than *Lindebergii*, and hardly differs from average south country "*umbrosus*," except by its bright pink petals, its more or less setose panicle, and its more unequal and usually weaker stem-prickles. In one place, however, a quarry near Catterick Bridge (N.W.Y.), I found in small quantity an intermediate form, having the habit and foliage of *Lindebergii* (which was plentiful in a neighbouring lane), and the pink petals and laxer and slightly setose panicles of *pulcherrimus* (which I failed to find in that vice-county). In the Helmsley neighbourhood, at Riccaldale, Nunnington and Rievaulx, occurs in considerable quantity a very strongly armed form (or forms) of *pulcherrimus*, linking this bramble with the *Spectabiles* group.

R. Dumnoniensis Bab. *N.W.Y. Bushy ground along the north bank of the Ure at Aysgarth, for some distance both above and

below the Falls. *M.W.Y. Waste ground between Giggleswick and the limekilns near Settle, in good quantity. Growing with *R. Lindebergii* in both localities, and somewhat resembling it, though quite distinct. A small form, with leaflets subrotund-cordate, shortly acuminate and very finely toothed, and remarkably long petiolules, which I put to *Dumnoniensis* without hesitation when fresh, but afterwards felt inclined to separate from it. Prof. Babington, however, is strongly disposed to confirm my first naming.

R. rusticanus Merc. Almost universally distributed, and locally common.

R. leucostachys Sm. N.E.Y. One of the most characteristic brambles of the vice-county. Especially abundant at Riccaldale and Rievaulx. N.W.Y. Seen only once in the neighbourhood of Richmond; but abundant and very fine at Redmire and Aysgarth, in Wensleydale. Very variable at Aysgarth.

R. villicaulis Koehl. (*R. calvatus* Blox.). N.E.Y. At Nunnington and Rievaulx, in plenty. Just the Bournemouth plant referred to in Dr. Focke's paper (Journ. Bot. 1890, 129) as common in that neighbourhood (in both Dorset and Hants). I have also gathered it in N.W. Derby, Merioneth, N. Wilts, and Devon N. & S.; and have specimens in my herbarium from Mid Perth (E. S. Marshall), Bangor (J. E. Griffith), Warwick (sent as *affinis* of Bloxam, J. E. Bagnall), S. Wilts (J. E. Tatum), and Somerset (R. P. Murray). It was considered to be "thoroughly typical *calvatus*" by Mr. Briggs, who had Devon plants so named for him by Mr. Bloxam. But I agree with Mr. Bagnall and the Rev. W. H. Purchas in thinking it considerably different from the Twycross (Leicestershire) and Shirley (S. Derby) plant. Dr. Focke calls both good *villicaulis* forms. In some W. Sutherland and E. Ross plants collected by Rev. E. S. Marshall last summer, we seem to have a third form connecting these two with some Bremen *villicaulis* that I have of Dr. Focke's collecting.

R. macrophyllus W. & N. Apparently uncommon. *N.E.Y. Nunnington. *N.W.Y. Billy Bank Wood, Richmond, in one spot. Aysgarth, here and there among the bushes by R. Ure.

R. Sprengelii Weihe. N.E.Y. Wood at Rievaulx. The typical plant. Seen nowhere else.

R. infestus Weihe. *N.W.Y. Near Leyburn; the prevailing bramble for about a dozen yards in a lane between the railroad and the river. Name confirmed by Dr. Focke.

R. Radula Weihe. Certainly one of the most generally distributed brambles of the Dales, and as a rule easily recognised, though varying much more than in the South. N.E.Y. Rather uncommon in the Helmsley neighbourhood, and always (so far as I saw) in a strongly armed form approaching *R. echinatus* Lindl. (to which Prof. Babington would put a specimen I sent him from Harriot Air). This form, and others which appear to me to connect it with typical *Radula*, I also found abundantly by the Swale at Richmond, and at Leyburn, Redmire, and Aysgarth, all in N.W.Y., in which district the ordinary plant was also abundant, especially by the Swale below Richmond, and at Ainderby. N.W.Y. Giggleswick and

Long Preston. I saw no bramble in the Dales that I should call *echinatus*.

R. rosaceus W. & N. *N.W.Y. Hill-side about two miles fom Richmond, on the Reeth Road, in good quantity. Named by Dr. Focke. A plant which I believe to be a shade-grown form of this, but which Dr. Focke is inclined to put under *R. fuscus* W. & N., occurs on both sides of the Swale, just above Richmond.

R. pallidus W. & N. *N.E.Y. One of the most abundant and constant *Rubi* of the Helmsley district, especially in the woods at Ouldray Gill, Riccaldale, and Rievaulx. Confirmed by Dr. Focke as "very characteristic," and by Prof. Babington.

R. Koehleri Weihe. Plants which I should place under an aggregate *Koehleri* are among the most common *Rubi* of the Dales. Of those I saw, perhaps the nearest to the type was a very handsome bramble that grew in considerable quantity on the wooded side of Wass Bank, opposite Byland Abbey (N.E.Y.), with leaves more densely hairy, and more sinuate-dentate than usual. But I believe *R. pallidus* Bab. to be the most frequent variety. From this I find myself unable to distinguish the two following, named by Prof. Babington.

R. saxicolus P. J. Müll. N.E.Y. Bottom of Ouldray Gill.

R. melanoxylon Müll. & Wirtg. *N.E.Y. Wass Moor. *M.W.Y. Near the Lime-kilns, Giggleswick. Of the plants from both these localities, Prof. Babington writes, "Probably the true *melanoxylon*."

R. dumetorum ferox Weihe. N.E.Y. Nunnington. Rievaulx. *M.W.Y. Aysgarth, very abundant. Redmire.

R. diversifolius Lindl. Very common in N.E.Y. and N.W.Y.

R. corylifolius Sm. Common and very variable. N.E.Y. Especially abundant at Rievaulx and Northallerton. Good *sublustris* at Nunnington and Brompton; and a small form, which may perhaps go under *fasciculatus*, in plenty at Rievaulx. N.W.Y. Common at Leyburn, Redmire, and Aysgarth, but at those places only rarely typical *sublustris*. At Ainderby, good *sublustris* and, I think, *fasciculatus*. M.W.Y. Frequent at Settle and Stainsforth, and most abundant at Long Preston. Good *sublustris* at Settle, and *fasciculatus* at Long Preston.

R. cæsius L. Frequent and variable in all the districts, and especially at Leyburn and Aysgarth (N.W.Y.).

The foregoing list contains all the *Rubi* I saw, except two or three obscure forms at Redmire and Aysgarth.

Rosa spinosissima L. N.W.Y. Frequent in Wensleydale, near Leyburn, Jervaulx Abbey, Aysgarth, and Penhill. Not seen in the other vice-counties.

R. involuta Sm. (aggregate). N.W.Y. Above Richmond, by the Swale, a small compact bush or two fruiting freely; and, about two miles further, on the Reeth Road, a different form, with leaves nearly naked above and densely glandular beneath, and very long and slender but slightly falcate prickles. Neither of these plants is at all like the very marked var. *Smithii* Baker, gathered near Richmond by Mr. Ward in 1870. By the Falls at Aysgarth, several large shade-grown arching bushes, with very mixed prickles, and thin *involuta*-like foliage, but without fruit. M.W.Y. In several spots

about Settle, Giggleswick, and Long Preston; weak forms, hardly distinguishable from *mollis*, and apparently passing into it. A very unsatisfactory species, so far as I saw it represented in the Dales.

R. mollis Sm. N.E.Y. Rare in the Helmsley district, where I saw only a bush or two at Rievaulx and Harriot Air. N.W.Y. One of the characteristic roses of Swaledale and Wensleydale. Especially abundant at Richmond and Aysgarth; at the latter place outnumbering all the other species put together, and having a good deal of var. *cærulea* amongst it. N.W.Y. Frequent.

R. tomentosa Sm. More or less common everywhere; usually quite abundant, and distinguishable with ease from *mollis*, though showing a great range of variation. Of the named varieties, I saw good *subglobosa* Sm. near Leyburn, and plenty of *scabriuscula* Sm. and *sylvestris* Lindl. in several places in all three vice-counties.

R. micrantha Sm. Seen only in one place, by the Falls at Aysgarth.

I met with no *rubiginosa* or *sepium*.

R. canina L. In the aggregate, as commonly understood by us in England, this rose is as frequent in the Yorkshire Dales as anywhere in the south; but in the Dales we find the true subcristate forms at home together with the ecristate, while in the south I now believe the species to be exclusively ecristate; though one occasionally meets with plants there that simulate the *Subcristatæ*, and may perhaps be ranked as intermediates. In N.E.Y. *arvatica* and *tomentella* seemed the commonest ecristates; *lutetiana*, *urbica*, and *Koscinciana* were common; and I met with *obtusifolia* at Brompton and Picton, *dumalis* (singularly scarce) and *biserrata* at Helmsley, and *decipiens* at Riccaldale. The *Subcristatæ* were represented in this district by *glauca* at Rievaulx, and *subcristata* at Harriot Air and Brompton. In N.W.Y. *lutetiana*, *dumalis*, *urbica*, *arvatica*, and *Koscinciana* were all common; *verticillacantha* occurred at Leyburn and Aysgarth, and *obtusifolia*, *tomentella*, and *andegavensis* at Ainderby. *Subcristata* was very common, and I met with *glauca* at Richmond and Aysgarth, and *implexa*, *coriifolia*, *Watsoni*, and *celerata* all at Aysgarth. In *glauca* and *subcristata* aciculate peduncles were frequent. In M.W.Y. subcristates seemed especially abundant: *glauca*, *subcristata*, *implexa*, and *Watsoni* at Giggleswick and Long Preston. and *subcristata* (especially) and *implexa* at Settle.

R. arvensis Huds. Locally abundant, but much oftener absent than is usual in the south. N.E.Y. Common in the Helmsley neighbourhood. N.W.Y. Ainderby. Jervaulx Abbey. Not observed in the Settle neighbourhood (M.W.Y.).

I looked in vain for *stylosa* forms, which I have not yet seen north of Wilts.

A NEW *HIERACIUM*.

By William H. Beeby.

Hieracium zetlandicum, mihi, sp. nov. (Group *Vulgata* Syme).—Stem from 3½ to 9 in. high, clothed below with rather

long white hairs which gradually become scarcer upwards; the apex with a dense felt of stellate hairs which gradually disappear towards the base; monocephalous, or with about 3 flowers arranged somewhat corymbosely. Radical leaves about 3 to 5 in a persistent rosette, oval-elliptic, with 4 to 5 small forward teeth on each side, rarely above 1½ in. long, olive-green (often strongly tinged with reddish purple) and subglabrous above, paler and more hairy below, ciliated; petiole short, hairy, about one-fourth the length of the root-leaves. Stem with about 2 leaves. Anthodes rather small, of a decided orange colour. Pericline (of the dried plant) somewhat truncate at the base; outer phyllaries blackish, short, broad and obtuse, with a fringe of black gland-tipped bristles along the back, otherwise practically glabrous; inner phyllaries longer, paler, and less obtuse, sometimes very sparingly ciliated towards the apex. Florets glabrous at the tips. Style, in the growing wild plant, very nearly pure yellow, with a slight tendency towards brown. Achenes resembling those of *H. Schmidtii*, but rather more shining, more deeply furrowed, and more truncate at the base.—*Loc.* Fine pasture above Sand Voe, Northmaven, Shetland. 4th July, 1889. (No. 1044).

Mr. F. J. Hanbury, being unable to identify the plant, sent it to Dr. Lindeberg, who reports:—"*H. norum, pulcherrimum, mihi ignotum!*" It most resembles a miniature example of *H. Schmidtii*, from which it is readily distinguished at sight by its small size, orange flowers, and olive-green leaves, and, on closer examination, by its broad, obtuse, almost glabrous phyllaries. The taller plants mentioned occurred towards the bottom of the hillside; and one specimen found quite at the bottom reached the height of 16 inches, and bore 10 flowers; this was growing on a patch of waste ground, and was evidently abnormal.

As I am opposed to the description of new species in critical genera by others than specialists, and regard it as an especially objectionable practice during the publication of a monograph, it is necessary to explain that, the present case not presenting any great difficulties, I have given the above description at the request of Mr. Hanbury, who has not had the opportunity of visiting Shetland and of seeing the plant in the wild state.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 85.)

Wade, Walter (d. 1825). M.D. A.L.S., 1792. Prof. to Roy. Dublin Soc. Caused establishment of their garden, 1790. 'Catalogus pl. in com. Dublinense,' 1794. 'Plantæ rariores in Hibern.,' 1804. 'Lectures on Grasses,' 1808. 'Salices,' 1811. Discovered *Eriocaulon*. Pritz. 336; Jacks. 617; R. S. C. vi.

221; Smith Corr. ii. 127, 147, 160: 'Irish Flora,' vii.; Mag. Nat. Hist. 1829, 305.

Wakefield, Priscilla, *née* **Bell** (1751–1832): b. Tottenham, Middlesex, 1751; d. Ipswich, Suffolk, 12th Sept. 1832; m. Edward Wakefield, 1771. 'Introduction to Botany,' 1796; ed. 8, 1818. Pritz. 337; Jacks. 36; Rose; Friends' Books, ii. 848; Gent. Mag. 1832, ii. 650.

Walcott, John (fl. 1778–1788). Of Bath. 'Flora Britannica Indigena,' 1778. Pritz. 337; Jacks. 233.

Walford, Thomas (fl. 1750–1818). Of Birdbrook, Essex. F.L.S., 1797. Correspondent of Sowerby. 'Scientific Tourist,' 1818. Contrib. to E. Bot. 259, 446, 630. MS. in Bot. Dept., Mus. Brit. Jacks. 233; R. S. C. vi. 239.

Walker, Mrs. A. W., *née* **Paton** (fl. 1830–55). Wife of Col. J. T. Walker. 'Tour in Ceylon,' Journ. Bot. 1840, 223. Ascended Adam's Peak, Comp. Bot. Mag. i. (1855), 3. Wight, Illustr. i. 18. Collected in Ceylon, 1830–40. Plants at Kew. R. S. C. vi. 239. *Patonia* Wight = *Xylopia*.

Walker, Rev. James (d. before 1880). M.A. Head-master, King's School, Parramatta. Woolls, 'Iindigenous Pl. Sydney,' p. 1.

Walker, J. K. (fl. 1829–1832). M.D. Of Huddersfield. 'Botany of Malvern Hills.' 'Midland Medical Reporter,' i. (1828–9), 100. R. S. C. vi. 244.

Walker, James Thomas (fl. 1810–71). Colonel. Collected in Ceylon, 1830–40. Plants at Kew. Journ. Bot. 1840, 223; R. S. C. vi. 244; viii. 1185.

Walker, Rev. John (1731?–1804): b. Edinburgh, 1731?; d. Edinburgh?, 22nd Jan. 1804. D.D., Edinb. Prof. Nat. Hist., Edinburgh University, 1775. Teacher of Robert Brown. MS. Adversaria, 1771, dividing 4 Linnean genera of Algæ into 14, Greville, 'Algæ Brit.,' iii. 'Experiments on Sap,' 1785. 'Essays on Natural History,' 1812. Discovered *Veronica fruticulosa* in Britain, 1782. Contrib. to E. Bot. (1028, 1585, 1643). R. S. C. vi. 245; 'Memoir.' 'Naturalist's Library,' vol. 26 (Birds, vol. 3), w. portr. engr. Lizars; Loudon, 'Arboretum,' 87.

Walker, Rev. Richard (fl. 1700–63). B.A., Camb., 1706. D.D., 1728. Vice-Master, Trin. Coll., Camb. Founded Cambridge Bot. Garden, 1761. Portr. in Thos. Martyn's 'Catalogus' of the Garden in Bot. Dep., Mus. Brit.

Walker, Rev. Richard (1791–1870); b. Norwich, 17th March, 1791; d. 31st Dec. 1870; bur. Olveston, near Thornbury. B.A., Oxon, 1814. M.A., 1817. B.D., 1824. F.L.S., 1829. Vice-President, Magd. Coll., Oxford. Master of Magdalen School, 1828–44. 'Flora of Oxfordshire,' 1833. Herbarium in possession of his family. Pritz. 337; Jacks. 258; Druce, Fl. Oxf., 394.

Walker, Thomas (fl. 1703). Sent plants from New Providence, Bahamas, to Petiver, Mus. Pet. p. 96.

Walker-Arnott, George Arnott (1799–1868): b. Edinburgh, 6th Feb. 1799; d. Glasgow, 17th May, 1868. M.A., Edinb., 1818. LL.D., Aberdeen, 1837. F.L.S., 1825. Regius Prof.

Bot., Glasgow, 1845, succeeding J. H. Balfour. 'Botany' in Encycl. Brit., ed. 7. 'Rhizophoreæ,' Mag. Zool. Bot. (1838), 359. 'Langsdorffia,' *id.* (1839), 36. 'British Flora' (with W. J. Hooker). Herbarium at Glasgow. Pritz. 9; Jacks. 516; R. S. C. i. 98; vi. 568; Trans. Bot. Soc. Ed. ix. (1868), 414; Gard. Chron. 1868, 683; Journ. Bot. vi. 223; Dict. Nat. Biog. ii. 120; Proc. Linn. Soc. 1869, 101. Portr. at Kew.

Wallace, James (fl. 1684–1724). M.D. F.R.S. In East India Company's service. Edited his father's 'Description of Orkney,' 1693, with list of plants in ed. 2, 1700. Reprint, 1883. Visited New Caledonia. In Darien (Phil. Trans. xxii. (1700), p. 536), and gave plants from there to Petiver and Sloane, Mus. Pet. n. 53; Hb. Sloane, 60, 157. Pult. ii. 8; Pritz. 337; Jacks. 258.

Wallen, Matthew (fl. 1788): b. Ireland. Resident in Jamaica. Cultivated plants. Assisted P. Browne. Don, Gen. Syst. iv. 8. *Wallenia* Sw.

Wallich, Nathaniel (1786–1854): b. Copenhagen, 28th Jan. 1786; d. Gower Street, London, 28th April, 1854. M.D., Copenhagen. F.L.S., 1818. F.R.S., 1829. Danish medical attaché at Serampore, 1807. H. E. I. C. S., 1813. Superintendent, Calcutta Garden, 1815–46. 'Tentamen Fl. Nepalensis,' 1824. 'Pl. Asiaticæ Rariores,' 1830–32. MS. Cat. of H. E. I. C. Herbarium. Pritz. 337; Jacks. 618; R. S. C. vi. 252; Gard. Chron. 1854, 284; Cott. Gard. vii. 3; xii. 90; Gent. Mag. 1854, ii. 84; 'Athenæum,' 1854, 556. Oil portr. by Lucas and engr. portrs. at Linn. Soc. Litho. by Maguire in Ipswich Museum series. Copy at Kew. Obelisk in Calcutta Garden. *Wallichia* Roxb.

Wallis, Arthur (fl. 1837–1843). Of Chelmsford; afterwards of Brighton. 'Plants of Chelmsford,' Proc. Bot. Soc. Lond. 34. 'Myosotis,' *id.*, 66. 'Orchideæ of Essex,' Mag. Zool. Bot. iv. (1840), 270. Contrib. to Merrifield's Nat. Hist. Brighton (pref. vi.). Proc. Bot. Soc. Lond. 1839; Jacks. 249.

Wallis, Rev. John (1714–1793): b. Croglin, Cumberland, 1714; d. Norton, near Stockton, 23rd July, 1793. M.A., Oxon, 1740. Curate of Symonburn, Northumberland; Haughton, 1775; and Billingham, near Darlington. 'Nat. Hist. of Northumberland,' 1769. Pult. i. 356; Jacks. 257; Gent. Mag. 1793, ii. 769; Chalmers; Nich. Anecd. vii. 704; viii. 758.

Wallis, John (fl. 1780–1836): b. Sussex. Timber Surveyor. Of Lambeth. 'Dendrology,' 1833; ed. 2, 1835. Pritz. 338; Jacks. 207.

Walsh, Rev. Robert (fl. 1818–47). LL.D. Rector of Finglas. M.R.I.A. Chaplain to Brit. Embassy at Constantinople. 'Hist. Dublin,' 1818, contains Cat. Dublin plants. 'Plants of Constantinople,' Trans. Hort. Soc. vi. 32 (1826). Irish Flora, viii.; Allibone; R. S. C. vi. 256.

Walter, Thomas (1740?–1788); b. Hampshire,' 1740; d. South Carolina, 1788. Planter. 'Flora Caroliniana,' 1788. The MS. brought to England in 1785 by John Fraser. Herbarium in Bot. Dept., Brit. Mus. Pritz. 339; Jacks. 362; Loudon, 'Arboretum,' 120; Appleton.

Ward, James (1803?–1873): b. 1803?; d. Manchester, 7th March, 1873. Of Richmond, Yorks. Orig. Memb. Bot. Soc. Ed. Eng. Bot. 2737, 2955. 'Salictum Brit. exsicc.' (with Leefe). List of Richmond plants in N. B. G. 274. Herbarium at Stonyhurst College. Journ. Bot. 1873, 222.

Ward, Nathaniel Bagshaw (1791–1868): b. London, 1791; d. St. Leonards, Sussex, 4th June, 1868; bur. Norwood. M.R.C.S. F.L.S., 1817. F.R.S., 1852. Examiner to Soc. of Apothecaries, 1836–54; Master, 1854. 'On growth of pl. in glazed cases,' 1842. Pritz. 339; Jacks. 618; R. S. C. vi. 265; viii. 1196; Proc. Linn. Soc. 1868–9, cxii.; Journ. Hort. xiv. (1868), 441; Semple; Trans. Bot. Soc. Ed. ix. (1868), 427. Oil portr. by Knight, R.A., and photo. at Linn. Soc. Litho. portr. at Kew. Portr. at Apothecaries' Hall. *Wardia* Harv. & Hook.

Waring, Rev. Richard Hill (1720?–94): b. Shrewsbury, 1720?; d. Berwick, near Shrewsbury, 11th Sept. 1794. Of St. James', Westminster. F.R.S. 'Plants found in several parts of England,' Phil. Trans. lxi. 359. Gent. Mag. 1794, ii. 966, 1051.

Waring, Miss S. (fl. 1827–41). 'The Meadow Queen, or the Young Botanists,' 1836. Jacks. 486; Allibone.

Warner, Richard (1711–1775): b. London?, 1711; d. Woodford, Essex, 11th April, 1775; bur. Woodford Churchyard. Correspondent of Linnæus. 'Plantæ Woodfordiensis,' 1771. Herbaria at Wadham Coll., Oxford, and in possession of Essex Field Club. Pult. ii. 281; Pritz. 339; Jacks. 262; Gibson, Fl. Essex, 147; Rose; Allibone. Oil portr. in possession of Sir Arthur Jervoise at Idsworth. *Warneria* Mill. = *Hydrastis*.

Warren, Elizabeth Andrew (d. 1864); d. Flushing, Cornwall, 5th May, 1864. Algologist. Of Flushing. 'Bot. Chart for Schools,' 1839. List of Falmouth Algæ in Rept. Cornwall Polytechnic Soc., 1849. R. S. C. vi. 269; Rept. Cornw. Polytech. Soc., 1864, 11; Journ. Bot. 1865, 101. *Schizosiphon Warreniæ*, Casp.

Waterhouse, Benjamin (1754–1846): b. Newport, Rhode Island, 1754; d. Cambridge, Mass., 2nd Oct. 1846. M.D., Leyden, 1780. 'The Botanist,' 1811. Sm. Corresp, ii. 173; Allibone.

Watkins, Charles R. W. (fl. 1855–74). Capt. in Bombay Army. 'Principles of Botany,' 1858. Pritz. 339; Jacks. 43.

Watlington, John (d. 1659): bur. Reading, 2nd Oct. 1659. Friend of Ashmole. "Apothecary in Reading, and a very good botanist," Ashmole's 'Life,' pp. 307, 308, 326.

Watson, Alexander (fl. 1825). "Militum præfectus." 'Flora Sta Helenica,' 1825. Pritz. 339.

Watson, Hewett Cottrell (1804–81): b. Firbeck, Yorksh., 1804; d. Thames Ditton, Surrey, 27th July, 1881; bur. Thames Ditton Churchyard. F.L.S., 1834. 'Outlines of distrib. of Brit. Pl.,' 1832. 'Remarks on Distrib.,' 1835. 'New Bot. Guide,' 1835–7. 'Cybele Brit.,' 1847–60. 'Compendium,' 1868–70. 'Top. Bot.,' 1873–4; ed. 2, 1883. Contributed to 'Phytol.' o.s. Discovered *Ranunculus tripartitus* in Britain, E. Bot. 2946. Herb. of Brit. pl. at Kew, of others at Owens

College, Manchester. MSS. in Bot. Dept., Brit. Mus. Pritz. 340; Jacks. 618; R. S. C. vi. 280; viii, 1202; Life, with photo. portr., Journ. Bot. 1881, 257; Gard. Chron. 1881, ii. 177. Photo. at Kew.

Watson, John Forbes (d. 1872). M.D. Indian Army Medical Service. Reporter to Government on Products of India. 'Flowers and Gardens,' 1872. Jacks. 221.

Watson, Peter William (1761–1830): b. Hull, Aug. 1761; d. Hull, 1st Sept. 1830. F.L.S., 1824. One of the founders of Hull Bot. Garden. 'Dendrologia Britannica,' 1825. Pritz. 340; Jacks. 244. Loudon, Gard. Mag., vii. 512; 'Arboretum,' 188; Corlass, 'Sketches of Hull Authors,' 109,

Watson, Sir William (1715–87): b. Smithfield, 1715; d. London, 10th May, 1787. Apothecary and Physician. F.R.S., 1741, M.D., Halle and Wittenberg, 1757. L.R.C.P., 1759. F.R.C.P., 1784. Knighted, 1786. Electrician. Papers in Phil. Trans xlii.–liii. Pult. ii. 295; Linn. Letters, ii. 481; Munk, ii. 348; Felton, 142; Michaud. Oil portr. by L. Abbot at Roy. Soc., engr. by Ryder, 1791. *Watsonia* Miller = *Antholyza*.

Watt, Mrs. (fl. 1801). Of Birmingham. Sent Algæ to Withering and Stackhouse. Stackhouse, 'Nereis,' xxix.

Watts, Rev. John Stanhawe (fl. 1750–1800). Of Ashill, Norfolk. B.A., Camb., 1772. F.L.S., 1798. Contrib. to E. Bot. 544, 556, 667.

Watts, Charles (fl. 1680). Apothecary. Curator of Chelsea Garden, circ. 1680. Ray Lett. 158–9; Evelyn, Memoirs, i. 606: Loudon, Encyc. Gard., 276; Semple.

Wauch, Captain (fl. 1824). Of Foxhall. Contributed Fungi to Greville's 'Fl. Edinensis,' vii.

Waugh, Richard (fl. 1805). One of editors of 'Bot. Guide Northumberland and Durham.' E. Bot. 1163, 1526; Jacks. 257.

Wavell, William (fl. 1783–1823). M.D., Edinburgh. F.L.S., 1823. Partner and successor of William Curtis in Gracechurch Street. Practised as physician at Barnstaple. E. Bot. 1612; Thornton, 'Life of Curtis,' 4–5; Fl. Midd. 393.

Weaver, Thomas (1803?–75): b. 1808?; d. Winchester, 31st Jan. 1875). Gardener, Winchester College. Knew Brit. pl. Under Baxter at Oxford Bot. Gard. Gard. Chron. 1875, i. 149.

Webb, Frederick Morgan (1841–80); b. Stafford, 1841; d. Edinburgh, Oct. 1880. F.B.S.E. Memb. Bot. Exchange Club. Curator of Edinburgh Bot. Gard. Critical on *Rosa* and *Rubus*. Edited 'Flora of Liverpool,' 1866. '*Utricularia Bremii*,' Journ. Bot. 1876. Contributed to Top. Bot., Trans. Bot. Soc. Ed. xiii. Journ. Bot. 1880, 382.

Webb, Jane. See Loudon.

Webb, Philip Barker (1773–1854): b. Milford, Surrey, 1793; d. Paris, 31st Aug. 1854. B.A., Oxon, 1815. F.L.S., 1818. In the East, 1818; in Spain, 1826; Madeira, 1828–30; Ireland, 1851. 'Iter Hispaniense,' 1838. 'Otia Hispanica,' 1839. 'Histoire Naturelle des . . . Canaries,' 1835–49. 'Fragmenta Florulæ Æthiopicæ-Ægyptiacæ,' 1848–9. 'Spicilegia,' 1849.

Herbarium at Florence. Pritz. 340; Jacks. 619; R. S. C. vi. 286; Gay, in Bull. Soc. Bot. de France, 1856; Michaud. Litho. portr. at Kew. *Webbia* DC. = *Vernonia*.

Webb, Rev. Robert Holden (1805?–80): b. circ. 1805; d. Essendon, Herts, March, 1880. B.A., Camb., 1829. M.A., 1834. Rector of Essendon, 1843. 'Flora Hertfordiensis' (with Rev. W. H. Coleman), 1849; Supplement, 1851. Pritz. 340; Jacks. 253; R. S. C. vi. 287; viii. 1204; Pryor, Fl. Herts, xliv.; Journ. Bot. 1880, 128.

Weddell, Hugh Algernon (1819–1877): b. England, 1819; d. Poitiers, 22nd July, 1877. M.D. In S. America, 1843–48, and 1851. 'Chloris Andina,' 1855. 'Hist. Naturelle des Quinquinas,' Journ. de Pharm. xvi. 1849, 161. 'Balanophoreæ,' *id.*, x. 1858–1861, 269. 'Monographie des Urticées,' Archiv. Paris Mus. ix. 1856, 1. Pritz. 341; Jacks. 619; R. S. C. vi. 296; viii. 1209; Gard. Chron. 1877, ii. 217; Journ. Bot. 1877, 288; Trans. Bot. Soc. Ed. xiii. 123; 'Notice,' Paris, 1856. *Algernonia* Baillon. *Weddellina* Tulasne.

Wedgwood, John (1766–1844): b. March, 1766; d. Seabridge, Staffordsh., 26th Jan. 1844. F.L.S., 1794. Eldest son of Josiah. Originator of Royal Hort. Soc. Proc. Linn. Soc. i. 245; Cott. Gard. ix. 357; Miss Meteyard, 'A Group of Englishmen,' 1871.

Weighell, William (d. before 1805). Of Sunderland. A.L.S., 1799. Had a herbarium. Winch, Bot. Guide, i. vi.

Weir, John (fl. 1864). Collector to Roy. Hort. Soc. in Brazil, 1861, and in Colombia, 1864. Journ. Hort. ix. (1865), 481.

Welwitsch, Frederick (1806–1872): b. Mariasaal, Carinthia, 25th Feb. 1806; d. London, 20th Oct. 1872; bur. Kensal Green. Botanical traveller. M.D., Vienna, 1836. A.L.S., 1858. F.L.S., 1865, Director of Bot. Garden, Lisbon. In Angola, 1853–61. In London, 1861–72. 'Sertum angolense,' Trans. Linn. Soc. 1869. Study set of plants at Lisbon; first set at Brit. Mus. R. S. C. vi. 310; viii. 1218; Gard, Chron. 1872, 1426; Journ. Bot. 1873, 1, with portrait; Proc. Linn. Soc. 1872–3, 37. Litho. portr. at Kew. *Welwitschia* Hook. f.

Wendy, Thomas (d. 1560). Physician. W. Turner, Libellus; Jacks. xxx.; Cooper, Athen. Cantab.

West, Tuffen (1823–91): b. Leeds, 1823; d. Frensham, Surrey, 19th March, 1891. F.L.S., 1861. Botanical draughtsman. Illustrated Smith's 'Synopsis of British Diatomaceæ,' &c. Journ. Bot, 1891, 224.

Westcott, Frederick (d. 1862?). Of Birmingham. A.L.S., 1841. Described *Cibotium Barometz*, Mag. Zool. Bot. v. (1840), 130. 'Floral Cabinet' (with G. B. Knowles), 1837–8. Contrib. to Phyt. i. 7, 54. Jacks. 472; R. S. C. vi. 329.

Westcott, G. B. (fl. 1838). 'Cat. of Plants in Birmingham Garden,' 1838. Jacks. 511.

Westmacott, William (fl. 1694). Physician, of Newcastle-under-Lyme, Staffordsh. 'Θεολοβοτανολογια sive historia vegetabilium sacri,' 1694. Ray Mem. 25; Pritz. 344; Jacks. 19.

Weston, Richard (1732?–1806): b. 1732?; d. Leicester, 20th Oct. 1806. 'Universal Botanist and Nurseryman,' 1770–7. 'English Flora,' 1775–80. 'Review of Principal Authors on Horticulture and Bot.,' Gent. Mag. 1806, ii. 997, 1100. Pritz. 344; Jacks. 619; Gent. Mag. 1806, ii. 1080; Felton, 66; Bot. Guide, 195.

Wharton, Samuel, *nom de plume* of **William Sherard.** [q. v.].

Whately, Thomas (d. 1821): d. Isleworth, Middlesex, 16th Nov. 1821. Surgeon, Old Jewry, London. Contrib. to Withering, ed. 2. Michaud.

Wheeler, Daniel (fl. 1840). M.R.C.S.L. Of Reigate, and afterwards of Chelmsford. '*Cuscuta Trifolii*,' Phyt. i. 753. R. S. C. vi. 344.

Wheeler, James (fl. 1763). Nurseryman. Of Gloucester. 'Botanists' and Gardeners' Dictionary,' 1763.

Wheeler, James Love (fl. 1821–70): d. 1870. Son of Thomas Wheeler. F.L.S., 1823. Bot. Demonstrator, Chelsea, 1821–34, 'Catalogus pl. medicinalium in hort. Chelsea,' 1830. Pritz. 345; Jacks. 410; Semple.

Wheeler, Richard (fl. 1699). Sent plants from Norway "for many years" to Petiver. Mus. Pet. p. 47.

Wheeler, Thomas (1754–1847): b. London, 1754; d. Aug. 1847. F.L.S., 1799. Bot. Demonstrator, Chelsea, 1778–1820. Pupil of Hudson. Proc. Linn. Soc. i. 380; Semple. Portr. by Briggs, R.A., at Apothecaries' Hall.

Wheler, Rev. Sir George, Knt. (1650–1724): b. Breda, 1650; d. Durham, 15th July, 1724; bur. Durham Cathedral. Hon. M.A., Oxon, 1683. D.D., 1702. Vicar of Basingstoke, Hants, 1685. Rector of Houghton-le-Spring, Durham, 1709. Prebendary of Durham, 1684. 'Journey into Greece,' 1682. Brought pl. to Plukenet, Morison, and Ray. Knighted, 1682. Plants in Herb. Sloane, 91, 96–8. Herbarium, in 4 vols., bequeathed to University of Oxford. Pult. i. 357 (MS. notes in Brit. Mus. copy), 'Memoir,' 1820?; Pluk. Alm. 49, 72, 190, &c. Engr. portr. at Linn. Soc. *Whelera* Schreb.

Whitaker, John (fl. 1830). '*Fucus natans*' Lewes, 1830. Jacks. 157.

White, Adam (1816?–78): d. Glasgow, 30th Dec. 1878. F.L.S., 1846. Bot. Soc. Lond. Assistant in Zool. Dept., Brit. Mus. 'Note on Peloria,' Mag. Zool. Bot. iv. (1840), 286. R. S. C. vi. 347; Journ. Bot. 1879, 96.

White, David (fl. 1808). Surgeon on Bombay Establishment. 'Malabar Cardamom,' Linn. Trans. x. 229. R. S. C. vi. 349.

White, Francis J. (fl. 1838–49). M.D. F.L.S., 1839. Of Warminster. 'Geography of Plants,' 1838. Pritz. 345.

White, John (fl. 1788–96). Surgeon-General, Botany Bay, 1788–95. F.L.S., 1796. Sent plants and specimens to J. E. Smith: 'Specimen N. Holland Botany' and 'Exotic Botany' (prefaces). Fl. Tasmania, cxxiv. 'Journal of Voyage to N. S. Wales,' 1790, with botanical appendix by Smith.

White, John (d. before 1845): d. Dublin, before 1845. Gardener,

Glasnevin. 'Grasses of Ireland,' 1808. Jacks. 247; Irish Flora, ix.; Phyt. ii. 345.

White, Taylor (fl. 1755). F.R.S. 'Cinnamon, Cassia, or Canella,' Phil. Trans. l. 860.

White, W. H. (fl. 1831–42). Memb. Bot. Soc. Lond. 'New species of *Epilobium*,' Mag. Zool. Bot. 1838, 208. R. S. C. vi. 350; Proc. Bot. Soc. Lond. 58, &c.

(To be continued.)

SHORT NOTES.

Is Asplenium marinum Linn. found in America?—The following note in answer to the above inquiry, from my former colleague, William Fawcett, Esq., Jamaica, if put on record, may prevent the continuance of an error.—W. Carruthers.

Asplenium marinum Linn., of the first edition (1753) of the *Species Plantarum* (p. 1081), is the European plant. In the tenth edition of the *Systema Naturæ* (1760) Linnæus quotes Plukenet's figure, *Phytologia*, tab. 253, fig. 5, as representing the species; but in the second edition of the *Species Plantarum* (1763) he established his var. *β*, of *A. maritimum* on Plukenet's plant, of which he had obtained a specimen in the herbarium of Dr. Patrick Brown which Collinson bought for him in 1758 for eight guineas. Plukenet's plant is preserved in Sloane's herbarium (vol. 99, fol. 21). It is *A. firmum* Kunze. There is no indication in the volume of its locality, but in his *Almagestum* Plukenet calls it "*Filix Trichomanoides Jamaicensis*" (p. 9). Brown's specimen is in the Linnean Herbarium, where it is named "*Asplenium marinum* 12" by Linnæus, the number referring to the first edition of the *Species Plantarum*. This plant is also *A. firmum* Kunze. Linnæus quotes with a query Sloane's *Lonchitis minor*, &c., Hist. p. 78, tab. 33, fig. 1. Mr. Jenman has examined Sloane's plant, and has correctly determined it to be a young plant of *A. auritum* Sw. Grisebach, in his *West Indian Flora*, includes *A. marinum* Linn., as well as *A. firmum* Kunze. The former is based on Sloane's Jamaica plant, and on a plant from St. Vincent, on the authority of Sir Wm. J. Hooker. It appears, however, from the recent collections made for Mr. Du Cane Godman in St. Vincent, that this is an error. Grisebach gives the distribution as "Coasts of the Atlantic from Orkney Islands to St. Helena, and New Brunswick to South Brazil." But there appears to be no foundation for considering *A. marinum* Linn. as an American plant, while *A. firmum* Kunze is found from Florida to Peru.

Lathyrus palustris L., in Glamorganshire.—I have lately received a specimen of this plant from Llanrhidian, gathered by Mr. Eve, Bedford, and as there appears to be no satisfactory record for S. Wales in Watson's *Cybele*, *English Bot.* Ed. iii., or any book which I have, I think the record may be interesting. My specimen is a poor one, with two flowers; but Mr. James Saunders has seen it, and says I am undoubtedly right in the nomenclature. —Charles Crouch.

TRIFOLIUM STRIATUM L., IN BEDS. — This plant, recorded in *Journ. Bot*,, 1889, p. 210, I have looked for in vain until this summer, when I found it in great profusion at Cainhoe, near Ampthill, in old pasture about an old sand-pit. I see no reason for supposing it to be an escape.—CHARLES CROUCH.

NOTICES OF BOOKS.

Lessons in Elementary Biology. By T. JEFFERY PARKER. pp. xi, 408; 89 figs. London: Macmillan & Co. 10s. 6d.

THE aim of this book is to "supply in the study the place occupied in the laboratory by 'Huxley & Martin,' by giving the connected narrative which would be out of place in a practical handbook." It may be said at once that so far as the botanical portion is concerned (and of that only do I venture to judge) Prof. Parker has succeeded admirably in his object. I have read the whole book with strict attention and profit to myself, as one of the class to whom it appeals, whose zoological (or botanical) education has been somewhat neglected and forgotten. Prof. Parker writes with great clearness and in an attractive style, his diagrams are excellent, and his acquaintance with his subject plainly at first hand. These are all the elements needed for a good book, and they are employed with judgment. Perhaps the best compliment that can be paid its author is to confess that he demonstrates the reality of that elusive subject, the science of biology. Botany we know, and zoology we know of, but biology—a judicious mixture of both—represents the average opinion on the subject. In certain universities and places where they teach it, or profess to do so, the matter is far simpler of definition. The student is taught botany by its professor on his peculiar plan, and zoology likewise. He is, however, examined in elementary biology, and it is managed in this way, *e. g.*:—

Botany	= 200	marks.
Zoology	= 200	,,
(Result) Elementary Biology	= 400	marks.

Elementary biology therefore equals what we were taught under the name of "simple addition" in our callow youth. At school it is simple addition; at the university, elementary biology. This is a naked description of fact, and the ordinary student trained in this way has no more notion of phenomena called biological, or of the significance of so describing them, than he has of why he "was made to mourn."

To cure him, and it may be some of his teachers, of this extraordinary and widespread delusion, there could be no better method than a study of Prof. Parker's book. He has selected with care a series of types (the 'type system' at its best), and he has minutely described and figured these, each in its bearings towards its environment. The result is a book which one reads with all the fresh eagerness of novelty, even though many of the types have become so familiar that boredom with them would be in no way surprising.

It is well printed and in handy form. There are a few minor slips, and other faults hardly to be accounted such; for example, the quotation of *Sphaerella pluvialis* as a synonym of *Haematococcus pluvialis*. This is correct enough, but excusable only in an exhaustive systematic treatise for an expert reader, since the genus *Sphaerella* has been so altered, modified and shunted that its quotation here might readily imply a wrong relationship in the eyes of an elementary student.

Without desiring further contention on the use and abuse of the root-word 'sperm' in terminology, I would point out that when used in its zoological sense, *e. g.*, 'spermaries' = antheridia, it is hardly consistent with its use in the other sense in the terms 'gymnosperm,' 'angiosperm.' Of course Prof. Parker did not invent such inconsistency, and he is not even blamed for its adoption; but in a book on general biology the darkness of our systems of terminology demands a way out. It is almost too much to hope that some biological conference will one day settle these things. It would be ungracious to part from this book with anything that sounds like fault-finding. It is a treasure to the amateur naturalist. G. M.

Handbook of the Ferns of Kaffraria. By T. R. Sim, Curator, Botanic Garden, Williamstown, South Africa. Aberdeen: Printed by Taylor & Henderson. 1891. 8vo, pp. 63, 66 plates.

This handbook contains popular descriptions of the sixty-eight Ferns found in Kaffraria, with outline plates of each of the species; there is also a chapter on fern-cultivation, and an explanation of the principal terms used in describing the genera and species. By its aid any of the Kaffrarian species can be easily recognised. Very few of the Cape Ferns are endemic, and several of them—e. g., *Aspidium aculeatum*, *Hymenophyllum tunbridgense*, and *Adiantum Capillus-veneris*—are familiar to us at home. A similar handbook, treating all the Ferns of the Colony, which number between 130 and 140, would be useful. J. G. B.

A Revised List of the Marine Algæ of the Liverpool Marine Biological Centre District. By R. J. Harvey Gibson, M.A., F.L.S.

The Distribution of Marine Algæ in Space and in Time. By George Murray, F.L.S. (Transactions of the Liverpool Biological Society, 1891).

Much time and trouble must be expended before anything approaching a complete list of the marine algæ of such an extensive district as that selected by the Committee of the Liverpool Biological Society as the area of their explorations can be compiled; all interested in the subject will therefore welcome Mr. Gibson's list as a valuable contribution to our knowledge of the distribution of our native algæ.

Out of a total of little more than 500 recorded British species, 250 are admitted into the list, while 21 more recorded by previous collectors as occurring in the district, but which have not been met with for many years, are added in an appendix. A capital table of

the distribution of the species within the prescribed area, and four good plates illustrative of some genera selected by the author for description, accompany the paper. Mr. Gibson has worked hard at the exploration of the district, and his researches have resulted in the discovery of many interesting forms new to the neighbourhood, amongst which may be mentioned *Rhodochorton seiriolanum*, a species recently described by the author in the *Journal of the Linnean Society*.

The list is a good piece of work, but we venture to think its usefulness would have been greatly increased if the author had added the date at which each species was in fructification in his district, as this varies very much in different localities. Much still remains to be done, and we trust that Mr. Gibson will continue his researches, and publish, at no distant date, a more extended list.

In the same volume with Mr. Gibson's *Revised List*, and separated from it by only a few papers, is an important paper by Mr. Geo. Murray, which deals with a subject that has attracted from algologists but little of the attention it deserves. This essay is full of interest from beginning to end, and should be in the hands of all those who are interested in Phycology. Mr. Murray first deals with what has been variously termed "vertical distribution," "zonal distribution," or "range in depth," and accounts in a very satisfactory manner for the puzzling but well-known fact that the distribution of marine algæ between tide-marks and beyond is more or less regulated by their colour. Dealing next with the distribution of algæ over the surface of the globe, the author has selected three important regions, and compares their marine flora one with another.

Although thirty years ago Johnstone and Croall, in their *Sketch of the Geographical Distribution of British Sea-weeds*, could say with truth, "The information as to the distribution of our native species on foreign shores is meagre in the extreme," this is very far from being true now. In nearly all modern standard works on Algology, such as those of Agardh, Kjellman, or Reinke, the geographical distribution of each species is noted, but very few attempts have been made to bring these scattered records together. The labour of sorting and arranging the material at their disposal, and satisfying themselves of the identity or not of the species recorded, without which any results arrived at would be useless and misleading, has prevented algologists from taking up the subject. Mr. Murray must therefore be congratulated on having overcome all the difficulties in his way in compiling the interesting "table" which accompanies his essay. This table shows at a glance how many genera and species are common to any two of the three widely separated regions (the Arctic Sea, the West Indian region, and Australia) selected by Mr. Murray for a comparison of their marine flora, and a study of it will give a much clearer idea of the distribution of the algæ of these regions than could be obtained from a perusal of any of the works from which it is compiled. As necessarily only a limited number of copies of Mr. Murray's paper can be offered to the general public, it is difficult to obtain, and we have therefore reproduced the table here in the hope that it may awaken an interest in a subject the investigation of which promises to yield such interesting results.

E. A. B.

	Arctic Sea		*West Indies*		*Australia*		*ALGÆ COMMON TO*							
							Arctic Sea and West Indies		*West Indies and Australia*		*Arctic Sea and Australiæ*		*All three Regions*	
FLORIDEÆ.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.
Ceramieæ	6	23	6	44	13	107	2	4	6	9	3	1	2	1
Cryptonemiaceæ ..	0	0	9	29	8	35	0	0	5	1	0	0	0	0
Gigartineæ	7	11	10	22	8	38	7	3	6	1	3	0	3	0
Dudresnayeæ	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Furcellarieæ	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Dumontiaceæ.....	3	5	0	0	2	2	0	0	0	0	1	0	0	0
Spyridieæ	0	0	1	6	1	10	0	0	1	2	0	0	0	0
Areschougieæ	0	0	1	1	3	18	0	0	0	0	0	0	0	0
Champieæ	1	2	2	6	4	17	1	0	2	2	1	1	1	0
Rhodymeniaceæ ..	5	6	6	20	11	59	2	2	5	3	3	1	2	1
Squamarieæ	5	6	1	1	3	8	1	1	1	0	2	0	1	0
Porphyraceæ	4	6	2	6	2	4	2	1	2	1	2	1	2	1
Sphærococcoideæ ..	0	0	4	61	14	42	0	0	2	5	0	0	0	0
Delesserieæ	2	8	3	6	4	37	2	1	3	1	2	0	2	0
Helminthocladiaceæ	0	0	6	40	8	22	0	0	6	12	0	0	0	0
Chætangieæ	0	0	2	2	5	7	0	0	2	1	0	0	0	0
Gelideæ	0	0	2	13	4	9	0	0	1	2	0	0	0	0
Hypneaceæ.....	0	0	2	21	6	30	0	0	2	4	0	0	0	0
Solieriеæ.....	0	0	4	12	6	20	0	0	4	3	0	0	0	0
Wrangelieæ	2	5	1	2	3	26	0	0	1	0	0	0	0	0
Lomentarieæ	0	0	0	0	1	2	0	0	0	0	0	0	0	0
Spongocarpieæ	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Chondrieæ	0	0	2	24	7	41	0	0	2	9	0	0	0	0
Rhodomeleæ	3	14	14	91	29	164	1	3	13	13	2	0	1	0
Corallineæ	4	16	7	37	8	44	3	3	6	10	3	2	3	2
Total..	44	104	85	444	151	743	21	18	70	79	22	6	17	5
PHÆOPHYCEÆ.														
Fucaceæ	5	14	4	33	20	118	1	2	4	3	1	1	1	0
Tilopterideæ	2	2	0	0	0	0	0	0	0	0	0	0	0	0
Dictyotaceæ	0	0	7	44	7	29	0	0	5	10	0	0	0	0
Ectocarpaceæ.....	6	16	1	13	3	5	1	0	1	1	1	1	1	0
Sphacelariaceæ	4	6	1	2	2	10	1	0	1	0	2	2	1	0
Chordariaceæ.....	6	7	6	8	7	13	3	2	4	2	2	1	1	1
Punctariaceæ.....	7	13	1	1	2	2	0	0	0	0	2	0	0	0
Arthrocladiaceæ ..	0	0	1	2	1	3	0	0	1	2	0	0	0	0
Sporochnaceæ	2	3	3	8	7	23	2	0	3	3	2	2	2	0
Scytosiphoneæ	2	3	0	0	1	1	0	0	0	0	1	1	0	0
Laminarieæ	5	23	0	0	2	5	0	0	0	0	0	0	0	0
Lithodermeæ	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Aglaozonieæ	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Ralfsiaceæ	1	2	1	1	0	0	1	0	0	0	0	0	0	0
Total..	42	92	25	112	52	209	9	4	19	21	11	8	6	1
CHLOROPHYCEÆ.														
Chætophoraceæ.....	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Siphoneæ	2	2	22	95	18	75	2	1	11	18	1	1	1	1
Conferveæ	11	27	4	77	13	64*	3	2	2	8	2	1	2	1
Ulveæ	5	23	4	15	3	10	3	5	2	6	2	5	2	4
Total..	19	54	30	187	34	149	8	8	15	32	5	7	5	6
PROTOPHYCEÆ Total..	6	9	10	45	18	31	4	0	5	3	4	0	4	0
AGGREGATE	111	259	150	788	255	1132	42	30	109	135	42	21	32	12

* A few of these are probably fresh-water.

BOOK-NOTES, NEWS, &c.

The account of the Potato-disease, to which we referred at p. 94, has been issued by the Irish Land Commissioners. Mr. Carruthers has succeeded by the use of plain and expressive words in giving an account of the potato-disease which cannot fail to be grasped by all who can read. This is accompanied by carefully drawn original figures in colour by Mr. Worthington Smith; and the whole is printed on stout paper, suitable for hanging on the walls of schools, farmhouses, &c. At the top are figures of a healthy potato,—tuber and leaf,—and at the bottom corresponding ones of diseased leaf and tuber. At the end of the narrative account there are hints for growers, all of them founded on some observation, except the last, which perhaps is too experimental in character. This refers to the possible good effects of administering sulphate of copper, and though it is not even recommended,—the passage is most cautiously worded,—it is in contrast with the firm and sure dealing with facts in the rest of the diagram. Perhaps its insertion may prove to be most wise, and we are far from saying it is a blemish on this example of how much knowledge should be spread. The Irish Land Commissioners and Mr. Carruthers are to be unreservedly congratulated on this issue of what, it is to be hoped, is the first of a series. The Royal Agricultural Society of this country has obtained for its use a number of copies, which are to be sold for the modest sum of 6d. We would venture to suggest that the Society should undertake a similar issue of others—say, of mildew, of corn and ergot, and other diseases of field crops.

Under the title *Science or Romance?* the Rev. John Gerard has issued a second series of essays dealing with some of the popular exponents of evolution. Readers of the former volume, which was noticed in this Journal for 1890, will be glad to have the second, which, though dealing with different phases of the subject, is equally interesting and attractive in style. It is published at 18, West Square, London, S.E., and its price is 1s.

The *Journal of the Royal Agricultural Society*, issued June 30th, contains an interesting paper on "The Canker of the Larch" (*Dasyscypha Willkommii*), by Mr. J. B. Carruthers, with illustrations by Mr. W. G. Smith.

Dr. George King sends us the third part of his *Materials for a Flora of the Malay Peninsula*, which includes *Malvaceæ*, *Sterculiaceæ*, and *Tiliaceæ*. The large number of novelties described continues to be remarkable; in the genus *Pentace*, ten of the eleven species described are new to science.

"Articles in Journals" is unavoidably delayed until next month.

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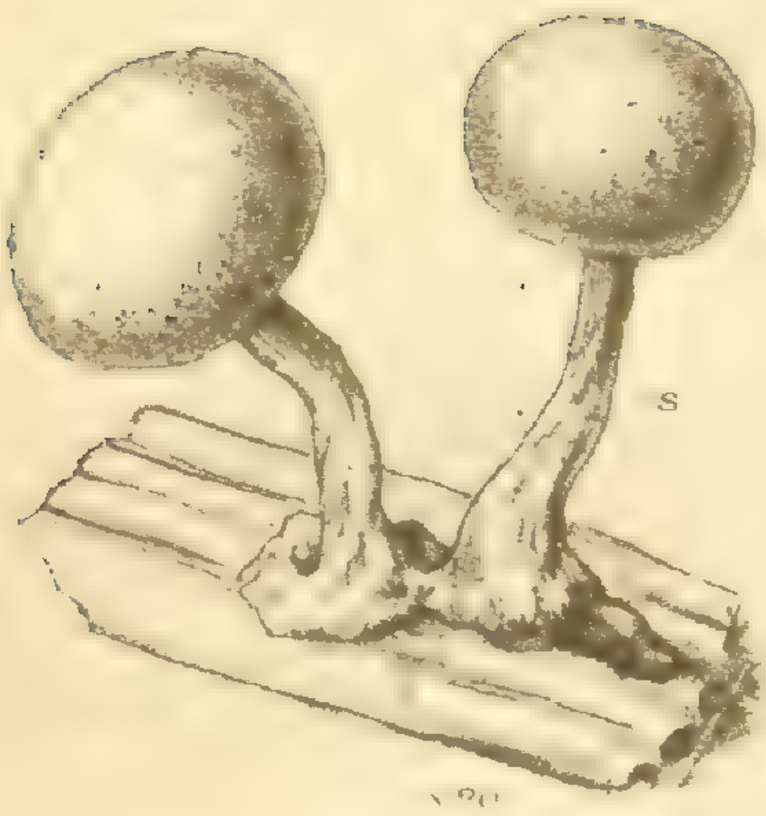
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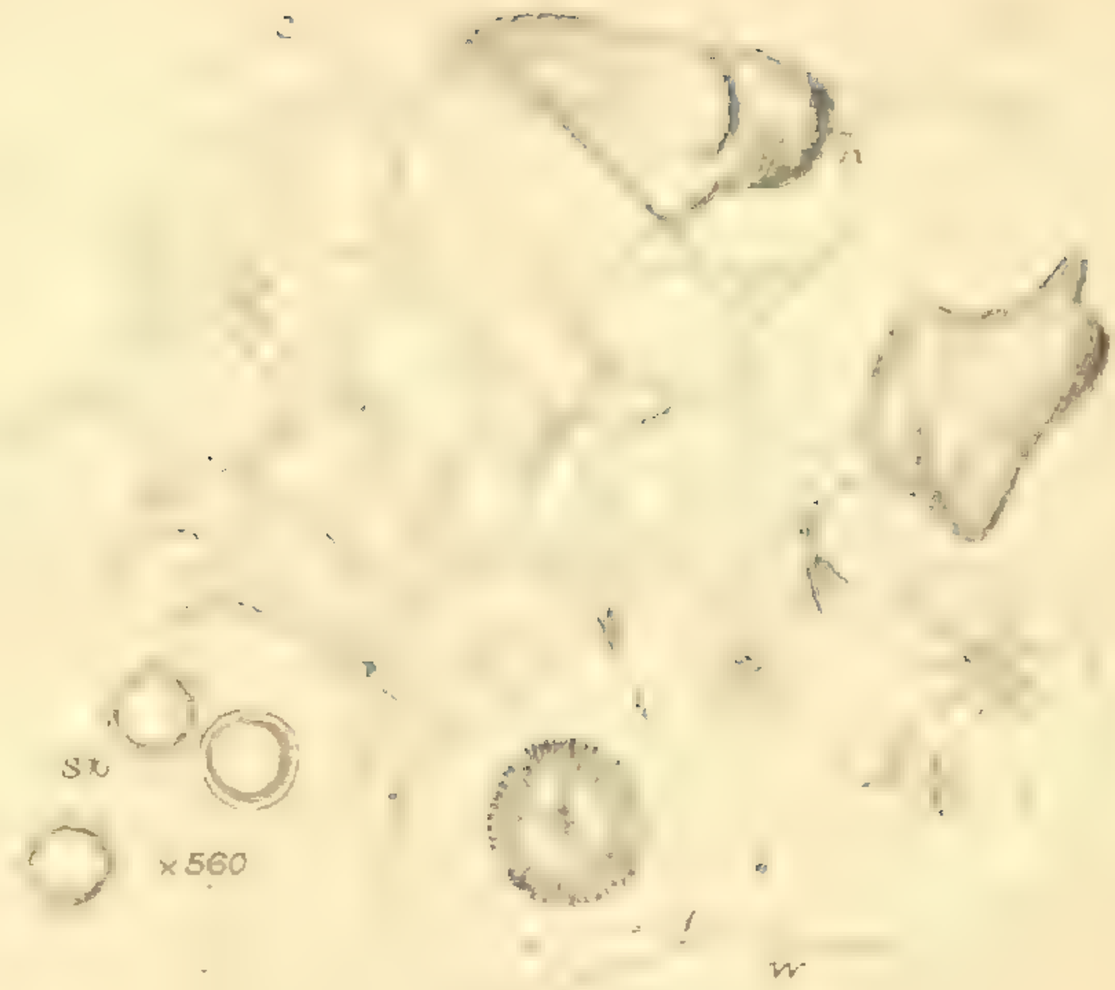
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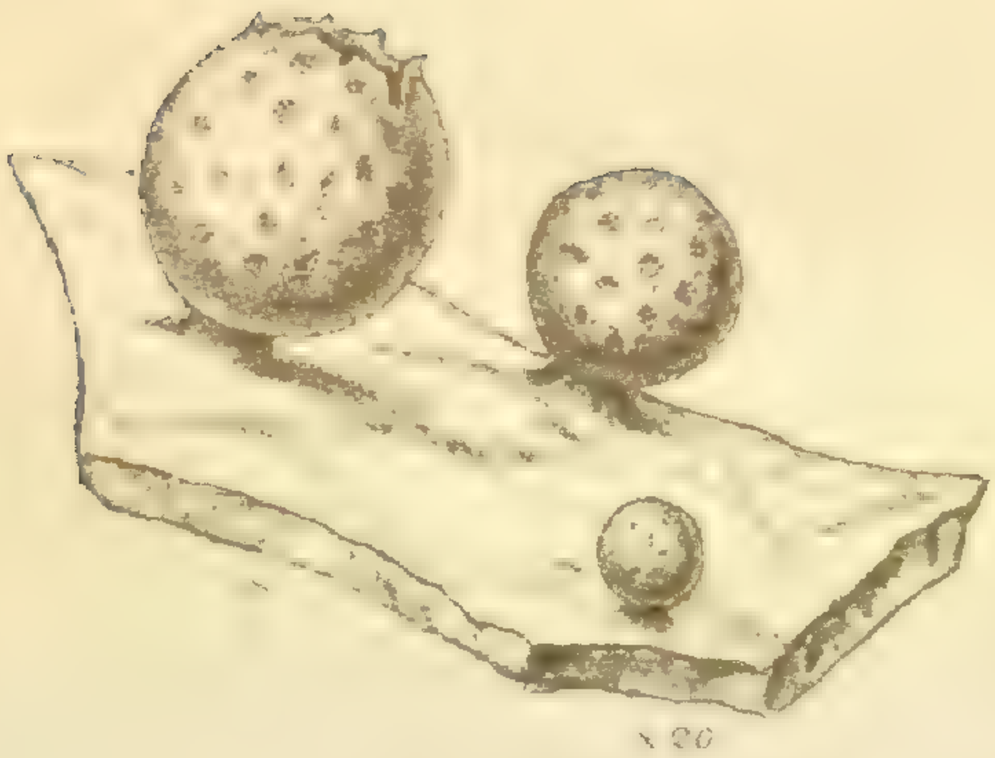
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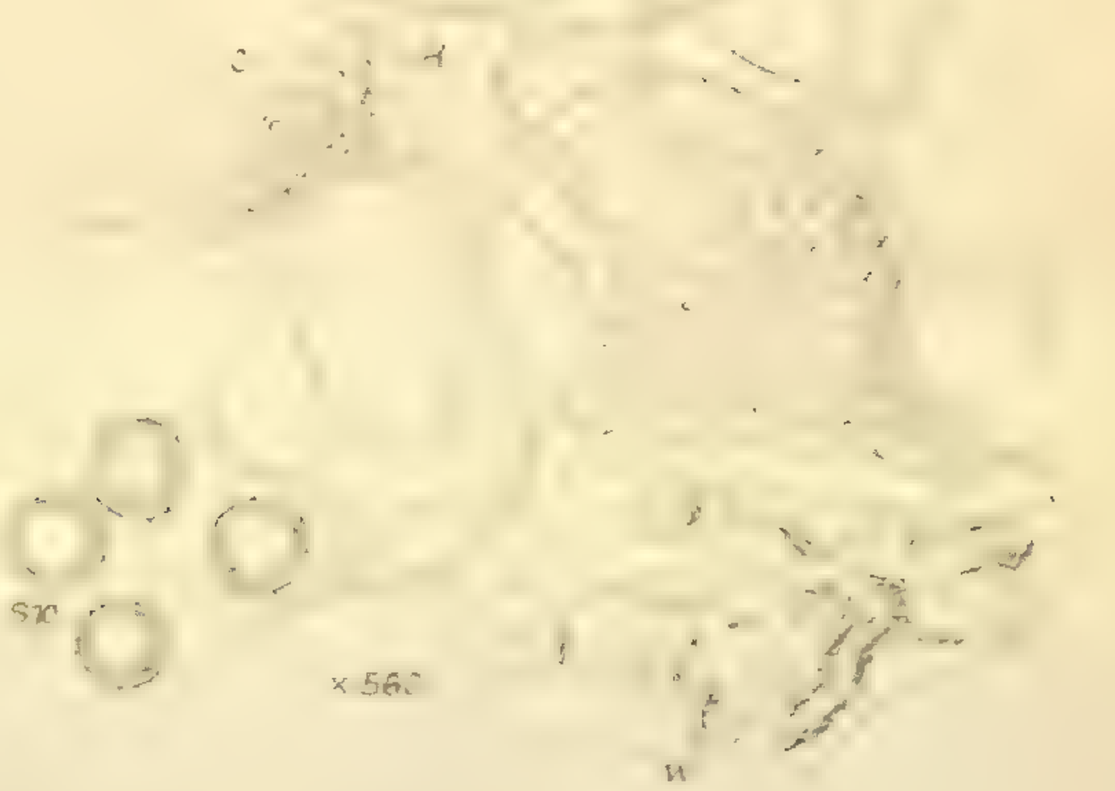


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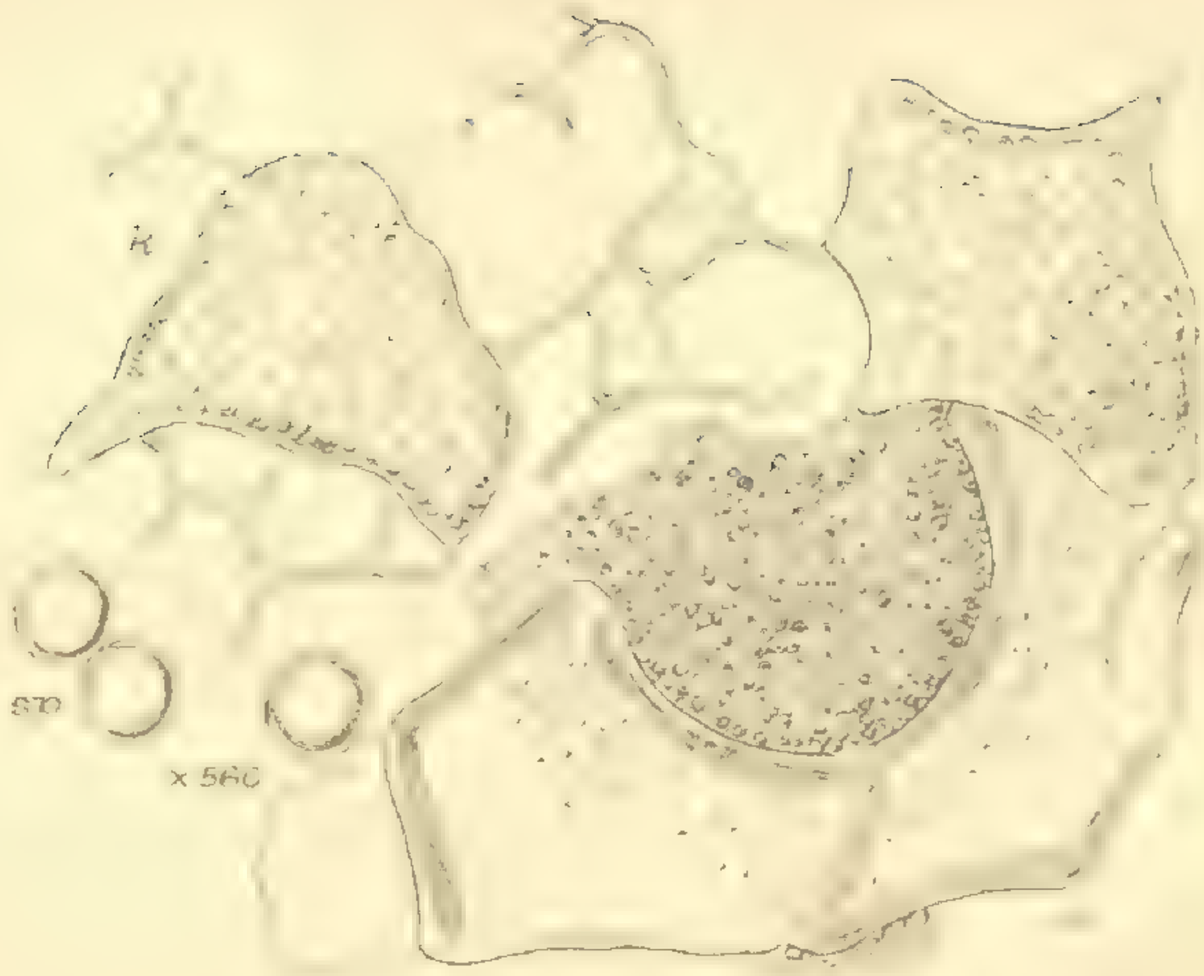


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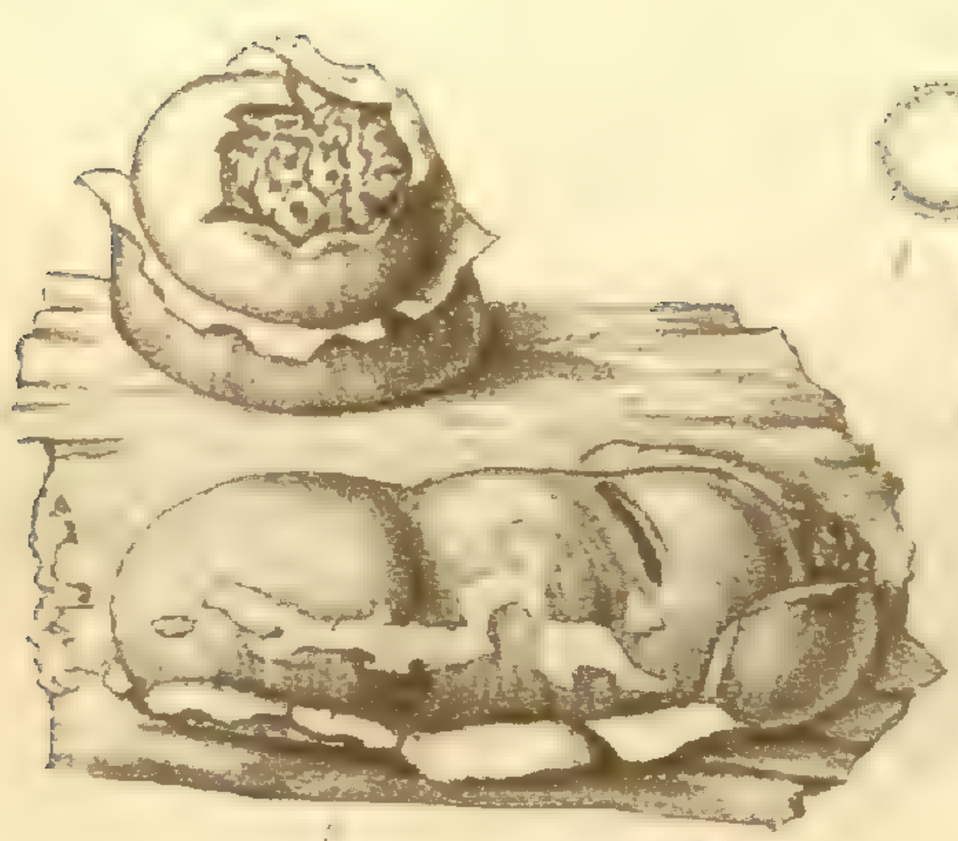
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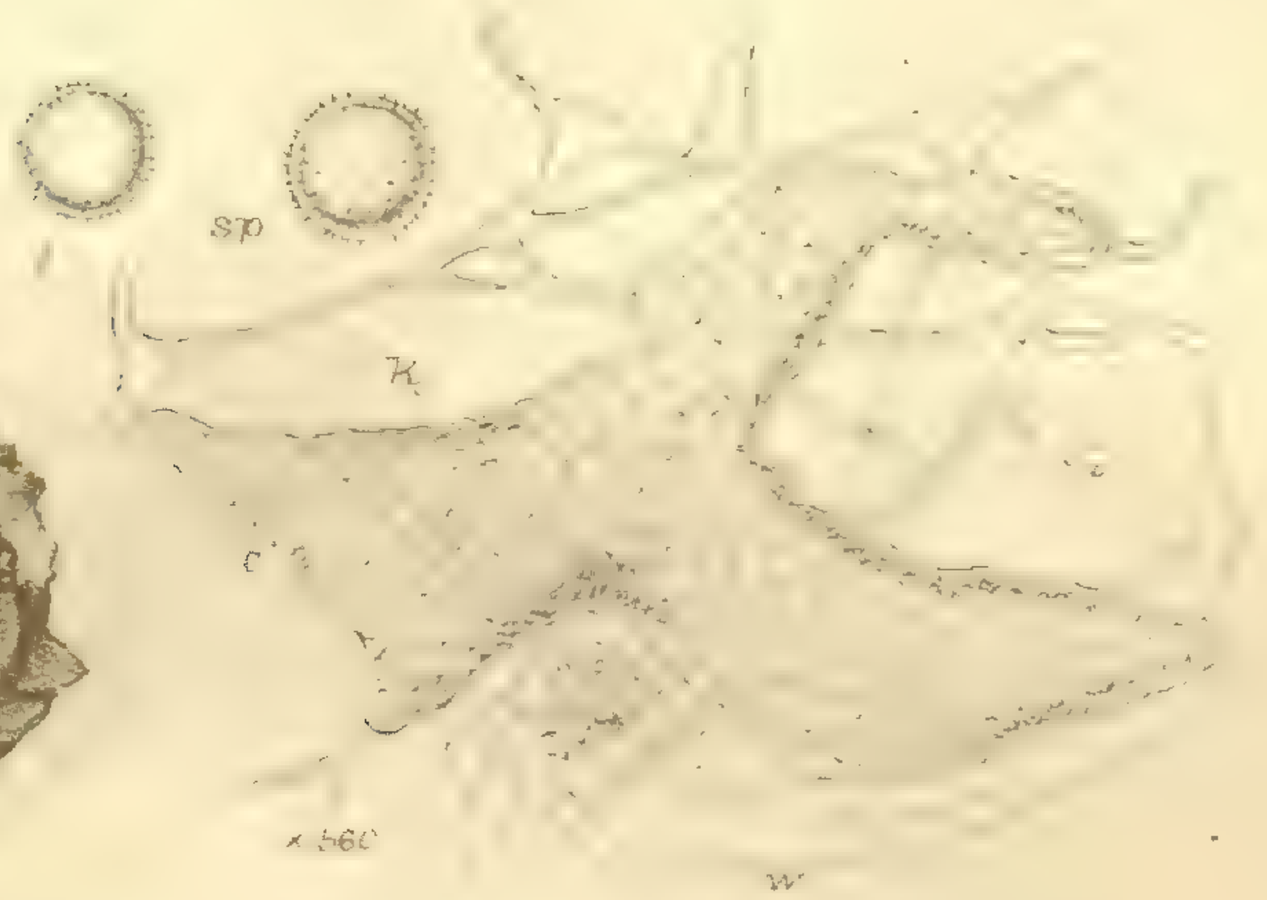
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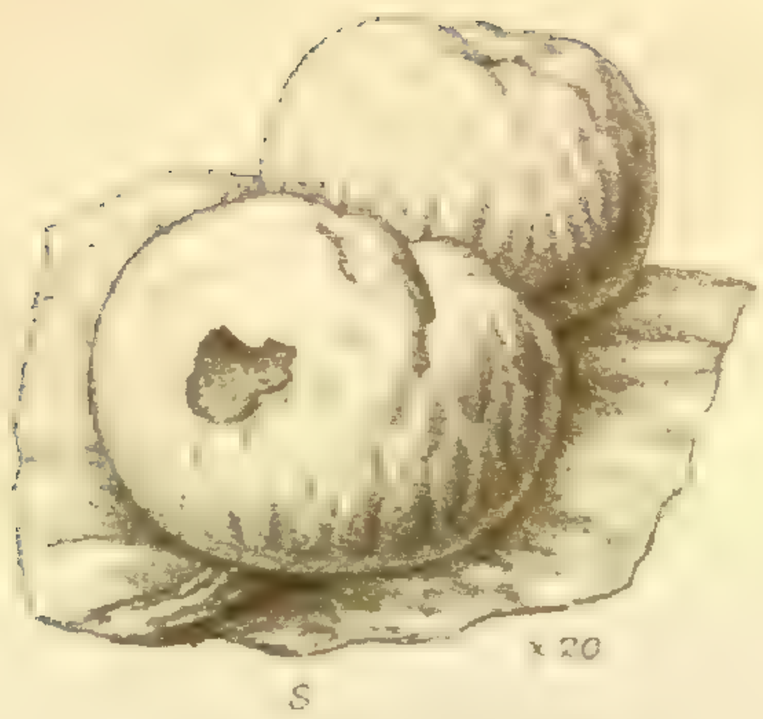


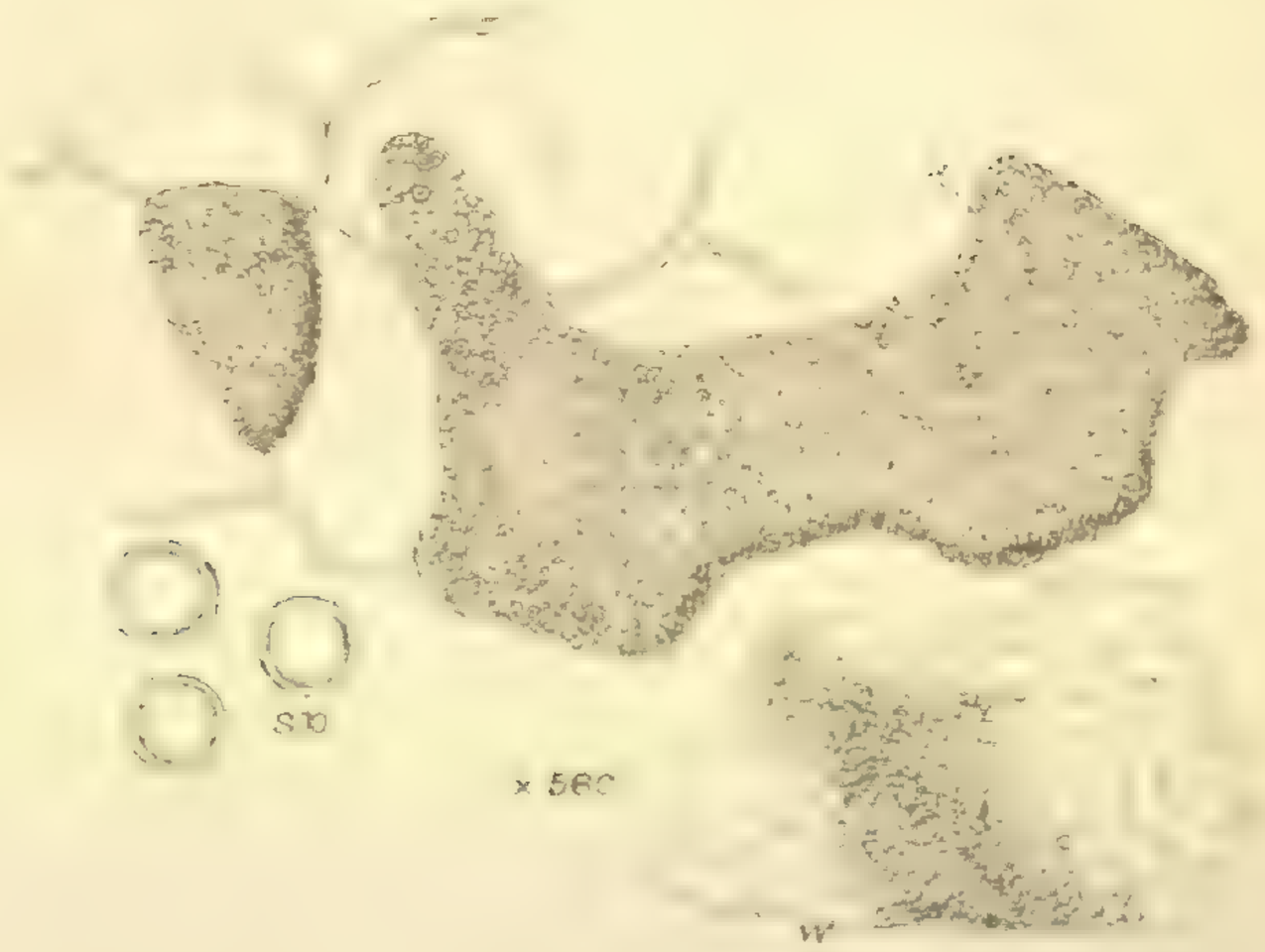
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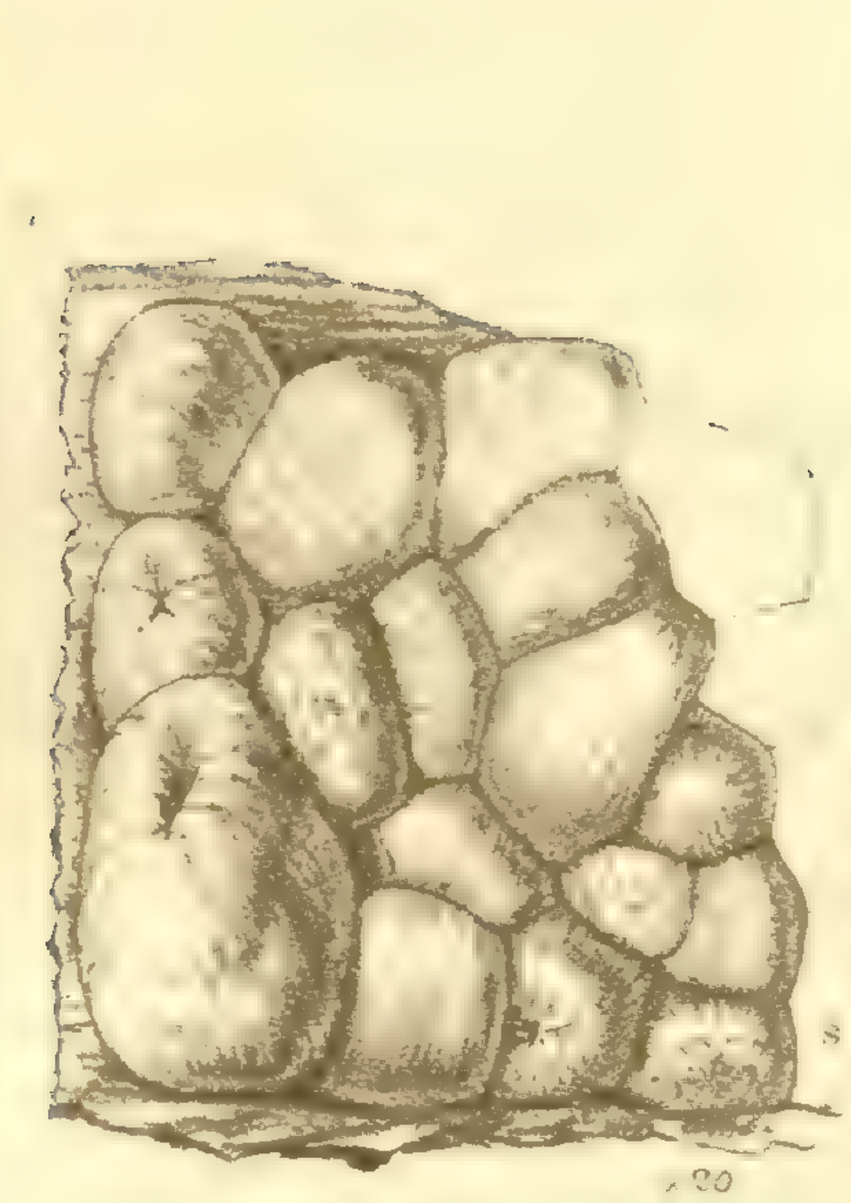
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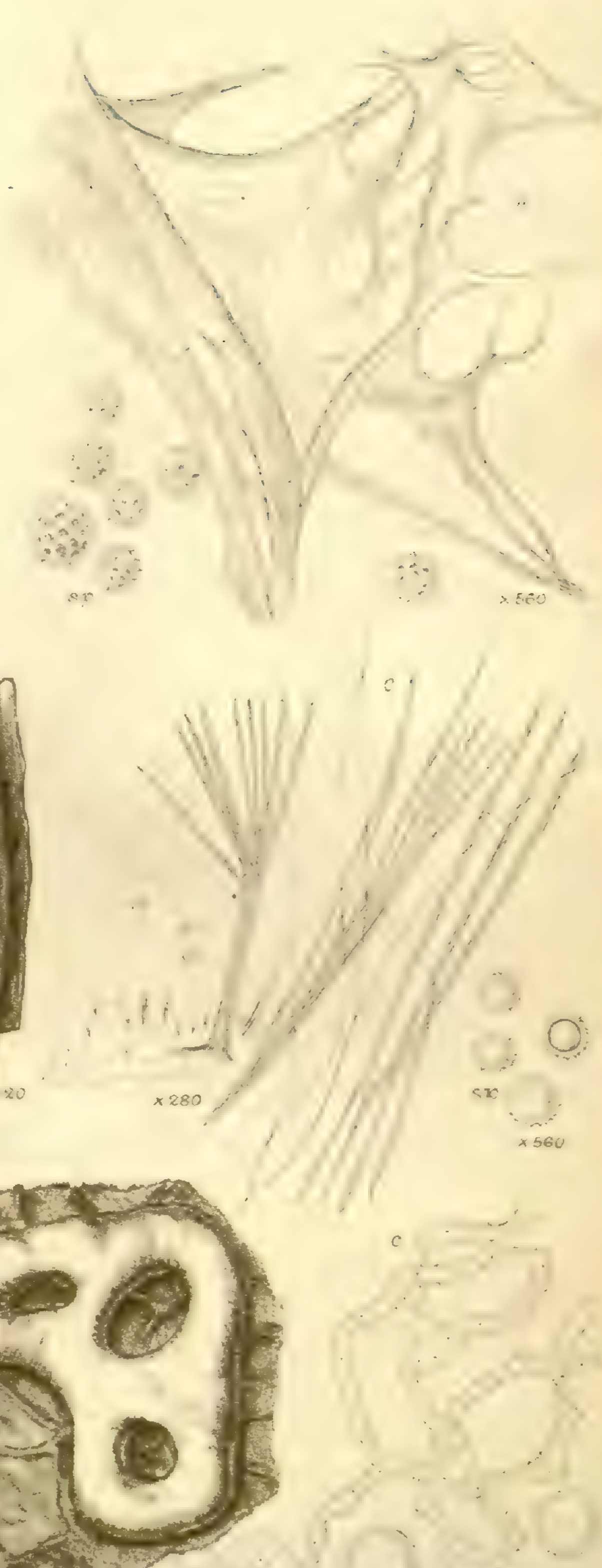
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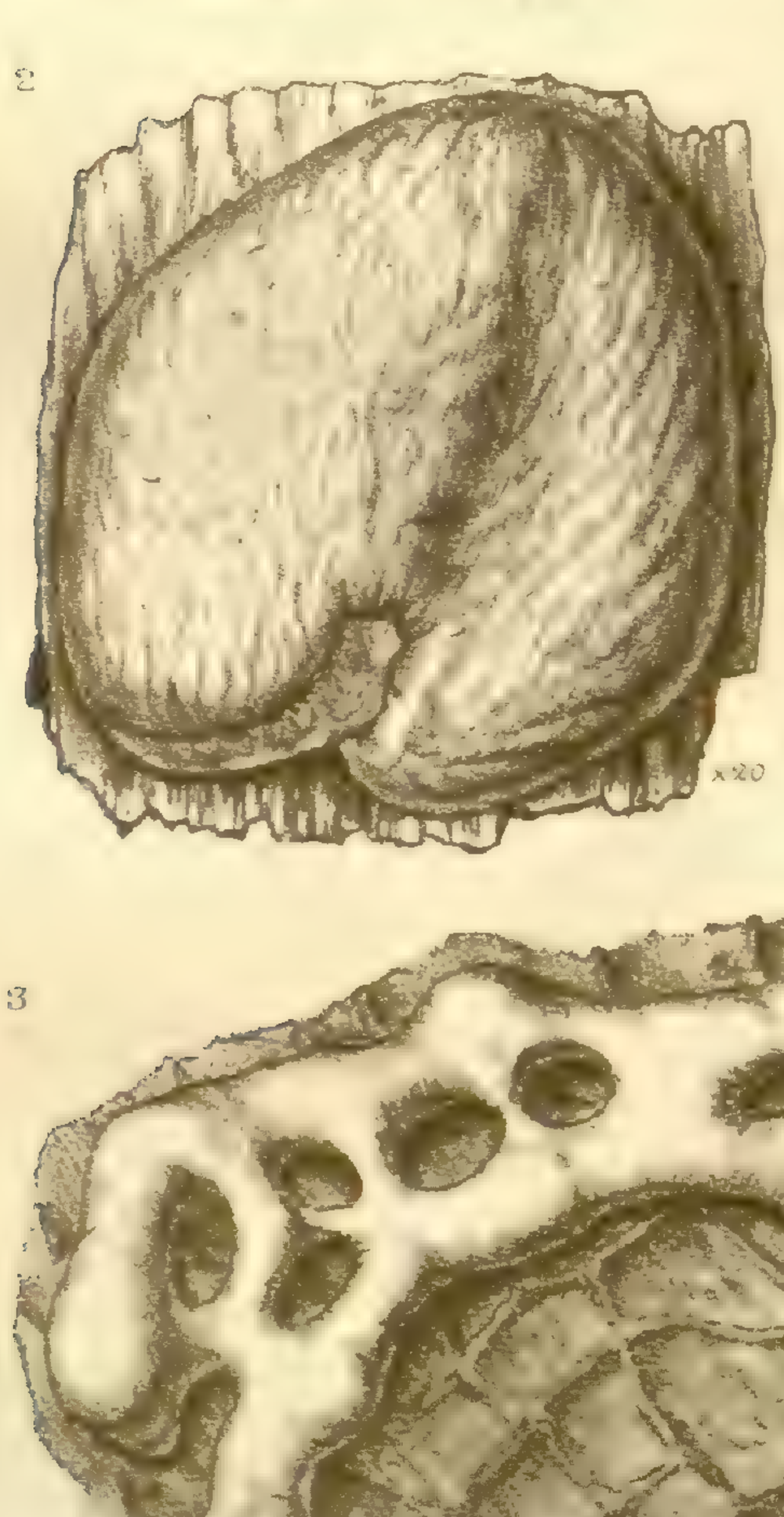
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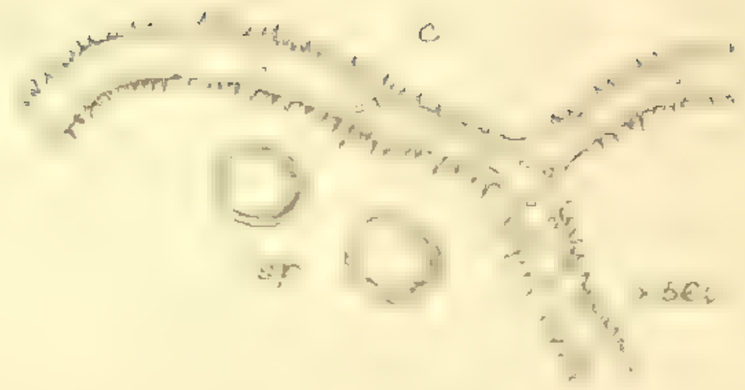
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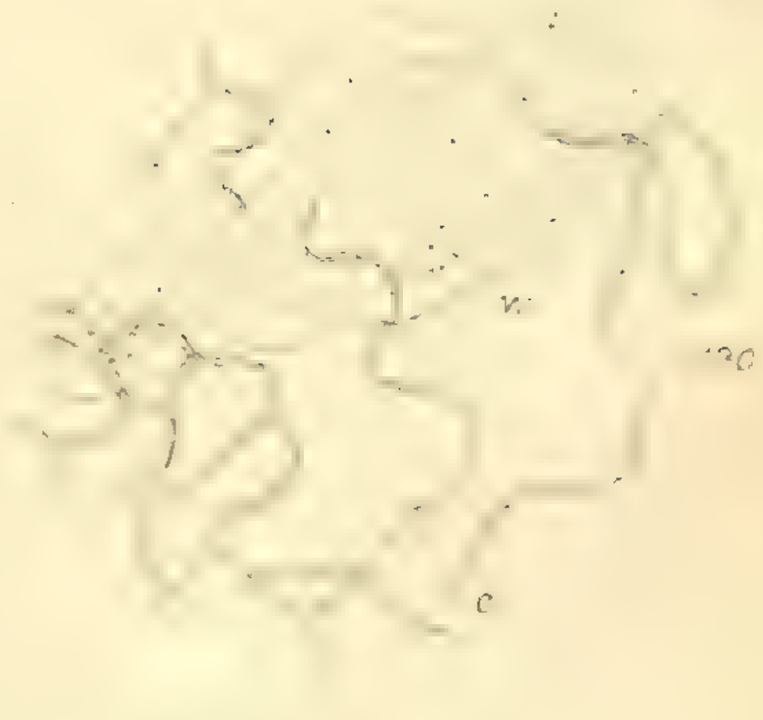


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NOTES ON MYCETOZOA.

By Arthur Lister, F.L.S.

(Plates 308–312.)

Having had the privilege of examining the specimens of Mycetozoa in the Kew and British Museum collections, and also those in the herbarium of Prof. Bayley Balfour, I submit a notice of species not included in Dr. Cooke's 'Myxomycetes of Great Britain,' which I have either obtained myself during the last ten years, or met with in the collections above referred to recorded as having been gathered in this country.

Although by no means an exhaustive list, I have mentioned those which seem to me to have a special interest, including a few which do not appear to have been hitherto described.

I should be very grateful to the readers of the *Journal of Botany*, who may have given attention to this group, if they would point out any errors into which I may have fallen, and supply any further information which may lead to a more thorough knowledge of the life-history of the class than we at present possess.

If the columns of the Journal could be opened to such contributions, I cannot doubt that additional light would be thrown on a study which has not received, in this country, the close investigation which the remarkable interest and beauty of the organisms would seem to demand.

Physarum psittacinum Ditm. in Sturm. t. 62; Rost. Mon. p. 104. *Didymium erythrinum* C. in Grev. 1873, n. 344. *D. Ravenelii* B. & C. in Grev. n. 346.—Peridiis sphæricis verruculosis, virescentibus; stipite subulato-gracili, aurantiaco, floccis hyalinis, copiosis, 1·5–2 μ diam. gangliis calcareis angulosis, copiosissimis intermixtis; sporis globosis, 7–8 μ diam. intus granulosis, levibus, fuligineo-violaceis; stipite amœne aurantiaco-rubello, striatulo.

Hab. in foliis putrescentibus fagi et piri in Suecia, Gallia, Germania, Italia et Carolina inf. Saccardo, Syl. Fung. vol. 7, p. 341.

In abundance at Highcliff, Lyme Regis, in July, 1889, in July, 1890, and in July, 1891, on a rotten sycamore stump. With characters as under:—

Plasmodium red orange, in rotten wood, spreading in broad veins on emerging from the substratum, and maturing on the wood and surrounding objects. *Sporangia* (× 40) globose, somewhat depressed, 0·5–0·8 mm. diam., purple, mottled with red, iridescent, when imperfectly matured greenish or fuliginous; gregarious or crowded, stipitate, sometimes sessile, or confluent. Sporangium-wall (× 560) hyaline, delicately membranous, sprinkled with orange spots of thicker, more or less granular, substance; crystalline white discs 14 μ diam. are scattered over the surface (wanting in some sporangia), (see Pl. 308, fig. 1 *w*). *Stalk* translucent, intense orange, equal, furrowed and rugose, rising from a well-

developed hypothallus of the same colour, enclosing no refuse matter; usually 0·5–0·7 mm. long, 0·1 mm. thick. *Capillitium* a close network of flat arching hyaline or yellow threads, broad at the angles; knots very numerous, angular, bright orange, obscurely granular or translucent, 10–20 μ diam., often densely confluent in the centre of the sporangium. *Spores* fuliginous-violet, smooth, 8 μ. Pl. 308, fig. 1).

Specimen No. 56 in the Kew collection, under the name *P. Schumacheri*, Newliss Head M. C. C., August, 1879, and No. 68, marked *P. Carlylei* Mass., date ?, are *P. psittacinum*.

On applying hydrochloric acid to the capillitium of this species no effervescence takes place, and only a few bubbles rise from the sporangium-wall, though the crystalline discs remain unaffected; the knots become slightly swollen and more granular in appearance. The acid changes all the coloured parts to deep crimson, then red-brown: this colour is persistent in glycerine jelly; mountings not thus prepared lose much of the orange tint both in jelly and balsam.

Physarum calidris, n. sp.—*Plasmodium ?*, among dead leaves. *Sporangia* subglobose, 0·5 mm. diam., scattered, snow-white, rugose, stipitate. Sporangium-wall (× 560) colourless, thickened with innate, more or less dense clusters of white-lime granules. *Stalk* of translucent substance, 1–1·5 mm. long, 0·1 mm. thick, subulate or equal, erect, furrowed, red-brown; not enclosing refuse matter, or rarely at the base. *Columella* none. *Capillitium* of colourless branching threads, with few flat expansions at the angles; lime-knots white, varying in size and form, 10–40 μ diam. or more. *Spores* pale brownish violet, smooth, 8–12 μ. Pl. 308, fig. 2.

On dead leaves, Lyme Regis, January, 1890. The capillitium varies much in sporangia of the same gathering; in one the hyaline threads may be abundant, and the knots scattered; in another the hyaline threads may be few, with the capillitium consisting almost entirely of intricately branching knots.

P. calidris is nearly allied to the very varying species *P. leucophæum*, and it is with some hesitation that I propose to separate it; but the straight red stalks, free from refuse matter, and the habitat of the plasmodium being dead leaves instead of the substance of rotten wood, are characters which appear to mark it as distinct.

The varieties of *P. leucophæum* are very numerous, exhibiting all connecting forms with *Tilmadoche nutans*, but in none of these have I met with the characters of *P. calidris* given above.

It is unfortunate that *Tilmadoche nutans* has been removed from the genus *Physarum*, as it would seem to be merely a variety, or perhaps more correctly a form of, *P. leucophæum*.

In Broome's collection in the British Museum three specimens very closely resemble the Lyme Regis gatherings of *P. calidris*.

No. 453, under the name of *P. elephantinum* B. & Br., from Ceylon, is a larger form, with sporangia 0·8 mm. diam., and is on wood, but appears to be otherwise identical.

No. 576, marked *Didymium ?*, from Thwaites, Ceylon, is on

wood, and seems to be the same species as the last, but is not in such good preservation.

No. 496, marked *Tilmadoche nutans*, from Palma, has clear red erect stalks, and only differs from the Lyme specimens in the smaller size of the lime-knots; it is on dead leaves of grass.

Physarum rubiginosum Fr. Symb. Gast. p. 21; Rost. Mon. p. 104; Karst. Myc. Fenn. p. 103. *Leangium rubiginosum* Fr. Stirp. Fungi, p. 83. *Physarum fulvum* Fr. Syt. Myc. iii. p. 143.— Peridiis gregariis, sessilibus, aurantiacis dein rubiginosis, columella destitutis, usque ad 1 mm. latis; granulis calcareis angulatis, minutis, aurantiacis; sporis levibus violaceo-atris, diam. 9–12 μ.

Hab. in muscis in Suecia et Fennia. Saccardo, Syll. Fung. vol. 7, p. 341.

Gathered by A. Camm near Smethwick, Sept. 1888. With characters as under:—

Plasmodium ?, among dead leaves (lebhaft gelbroth, Schroeter). *Sporangia* (× 40) sessile, subglobose on a narrow base, 0·5–0·8 mm. diam., gregarious, orange, rough with ferruginous spots. Sporangium-wall (× 560) thickened with innate clusters of bright orange lime granules. *Capillitium* of abundant branching hyaline, or pale yellow threads, with flat expansions at the angles; knots orange, triangular or irregular, 10–20 μ diam. or more. *Spores* pale violet-grey, very minutely spinulose (× 1200), 7–9 μ.

On dead holly leaves. Pl. 308, fig. 3.

Physarum Braunianum de Bary, Rost. Mon. p. 105. — Peridiis irregulariter globosis, minutis, sessilibus, simplicibus vel in acervulos collectis brunneis; columella nulla; capillitio bene evoluto, granulis calcareis parvulis, fuscis, anguloso-globulosis; sporis violaceis, levibus, 10–11 μ diam.

Hab. ad Grünewald pr. Berlin in Germania (A. Braun). Saccardo, Syl. Fung. p. 341.

Gathered by Prof. Bayley Balfour at Moffat, 1879. With characters as under:—

Plasmodium ?. *Sporangia* (× 40) sessile, irregularly globose, gregarious, dull pinkish umber, somewhat rugose, 1 mm. diam. Sporangium-wall (× 560) thickened with dense innate clusters of brown lime granules. *Capillitium* of hyaline threads, with numerous obtusely angled, roundish, or fusiform dark umber lime-knots, 10–20 μ diam., a few much larger and branched. *Spores* pale violet-grey, smooth, 8–10 μ.

On bark, Moffat. Pl. 309, fig. 3.

In the two scanty gatherings of this species obtained by Prof. Balfour, a single sporangium was discovered with a short brown stalk, and a conical dark umber columella, which is wanting in the sessile forms.

Physarum conglomeratum (Fr.), Rost. Mon. 109, &c.— "Sporangiis discretis, conglomeratis, sessilibus rotundatis, angulatis, applanatis, membrana exteriori crasiuscula, granulosa, calcarea, fragili, flava vel ochracea, interiori tenella, cinerea vel flavescente, lat. 0·2–0·5 mm.; capillitio granulis calcareis, numerosis,

angulato-irregularibus ; coloratis prædito ; columella centrali cylindracea ; sporis parce spinulosis, violaceo-atris, 8–9 μ.

"Hab. in foliis et muscis raro in Germania, Suecia, Fennia et S. Francisco Californiæ." Saccardo, Syl. Fung. p. 342.

Gathered at Foxley, Hereford, Oct. 1879 ; in collection of Prof. Bayley Balfour. The Kew collection contains three specimens under the name *Diderma contextum*. Nos. 95 and 362 from "Darenth M. C. C."; No, 369 is also probably British ; No. 96 is a fine specimen from Ceylon, rightly named. Broome's collection at the British Museum has three foreign specimens. In all these the characters agree with the description given below of the Foxley gathering :—

Plasmodium ?. *Sporangia* (× 40) subglobose, sessile on a broad base, densely aggregated on one plane, angled by mutual pressure, 0·3–0·5 mm. broad, yellow or brownish white, mottled with paler shades. Sporangium-wall (× 560) double ; on the upper convex surface the inner layer is cartilaginous, translucent, pale yellow, with curved thickenings having a vitrious fracture ; the outer layer is thick, forming a crust of easily crumbling yellow lime granules ; wall below thin, with the two layers less distinct. *Capillitium* of delicate, much branching hyaline threads, with numerous white or yellowish lime-knots varying in size, 10–100 μ diam. or more.* *Spores* pale violet-brown, nearly smooth, 8–10 μ.

On dead leaves, moss, &c. Pl. 309, fig. 1.

The pale, nearly smooth, and smaller spores readily distinguish this species from *P. contextum* Pers.

Physarum Diderma Rost. Mon. p. 110. — Peridiis sessilibus, basi angusta adnatis, globosis, niveo-albis, tunica peridii duplici, externa densiori, fragili, crassa, calcigera, interna tenui, valde distante, granulis calcareis plurimis anguloso-globulosis columellam obsoletam formantibus ; sporis subviolaceis, aculeatis, 9–10 μ diam.

Hab. in .... Varsoviæ Poloniæ (Alexandrowic). Saccardo, Syl. Fung. p. 338.

A gathering of this species was obtained in Wanstead Park, Essex, Feb. 1887. With characters as under :—

Plasmodium ?, among dead leaves. *Sporangia* scattered, sessile, subglobose or elongated, 1 mm. diam. on a contracted base ; or pulvinate plasmodiocarps, 2–6 mm. long, white, smooth. Sporangium-wall (× 560) double ; the outer fragile, more or less densely charged with white lime granules, free and deciduous above, recurved below, and remaining attached to the basal margin of the plasmodiocarp ; the inner wall persistent, of two layers, the upper thin, colourless, combined with the somewhat membranous purplish lower layer. *Capillitium* of branching hyaline threads, with few flat expansions at the angles ; lime-knots numerous, large, and variously shaped, white, 10–100 μ diam. *Spores* dark purplish brown, spinulose, 10–12 μ.

On dead leaves. Pl. 309, fig. 2.

There is one specimen of this species in the Kew collection, No. 38, under the name *Physarum sinuosum*. It consists of irregular

* The columella mentioned in Saccardo is wanting in the sporangia I have examined.

pulvinate plasmodiocarps, with the papery outer wall much recurved; the lime-knots attain the size of 200 μ; the granules of which they are composed, as well as those in the calcareous wall, are large, 1·5–2 μ diam., agreeing in this character with the Wanstead gathering; there is also a good specimen from Rabenhorst, No. 512, in Broome's collection, under the name *Diderma contortum* Hoff. It is quite a distinct species from *P. sinuosum* (Bull.), Rost.

Didymium dubium Rost. Mon. p. 153. — Plasmodiis pulvinatis, arcuatis, sparsis, niveis, stellatis crystallis in superficie conglomeratis præditis, in acervulos congestis; pariete externo ab interno squamis irregularibus decidente; capillitio e floccis rigidis, solidis, raro diffluentibus, reticulum solutum efformantibus, protuberantiis, spinosis, hamatis præditis formato; sporis subviolaceis vix verruculosis, 10–11 μ diam.

Hab. in Bohemia (Opiz). Saccardo, Syl. Fung. p. 376.

Abundant at Lyme Regis in the winter and spring of 1890, and not unfrequent in the two previous years. With characters as under :—

Plasmodium watery white, among dead leaves. *Sporangia* pulvinate, much depressed, with an irregular rounded outline, 1–12 mm. broad, snow-white. Sporangium-wall (× 560) double, the outer layer of large stellate crystals of great beauty, interwoven in a continuous fragile crust extending beyond the somewhat thickened margin of the membranous base; inner layer more or less free from the upper, membranous, purplish towards the base. *Capillitium* profuse, of rigid, erect, dark purplish brown threads, 130–150 μ in length, attached above and below to the membranous wall, and connected together mostly towards the extremities by short transverse or oblique anastomosing processes forming a net. *Spores* violet-grey, minutely spinulose (× 1200), 8–15 μ, usually 8 μ.

On dead leaves, especially ivy. Pl. 310, fig. 1.

In sporangia unfavourably developed the capillitium is sometimes flexuose and irregularly branched. The spores vary in size in different sporangia; in some they average 13 μ, ranging from 12 to 15 μ. This species is allied to *Chondrioderma difforme* (Pers.), Rost., which is a true *Didymium*, as named by de Bary. (See *Annals of Botany*, June, 1890).

The fact that the spores of *D. dubium* are found of one-half greater diameter in some sporangia than in others, and that nearly the same difference occurs in some other species,—as, for instance, in *Physarum compressum*, where the larger size is accompanied by a more spinose epispore,—suggests a caution against taking these characters alone as indicating specific distinctions.

Lamproderma echinulatum (Berk.), Rost. Mon. App. p. 25. *Stemonitis echinulata* Berk. Fl. Tasm. p. 268. — Peridio globoso columbino-chalybeo; stipite valido aterrimo sursum attenuato, semipenetrante; capillitio palido globoso; sporis magnis crasse rigideque echinulatis, 16–20 μ.

Hab. inter muscos Tasmaniæ (Archer). Sphæricum cæruleo metallicum; stipites nigri, rigidi, cylindrici rarius subulati versus verticem; columella magna, rigida, cylindrica, in vertice globosa,

⅔ attitudinis peridii attingens; flocci capillitii lati furvi, in densum reticulum junctis, in nodis conspicue triangulariter dilatatæ. Saccardo, Syl. Fung. p. 391.

Gathered by Prof. Bayley Balfour at Moffat, 1879. Found also at Lyme Regis, Dec. 1890. With characters as under :—

Plasmodium ?. *Sporangia* globose, 0·7 mm. diam., iridescent, stipitate. Sporangium-wall hyaline, membranous, soon falling away or hanging in torn fragments about the more persistent base. *Stalk* black, shining, subulate or cylindrical, 1–1·5 mm. long. *Columella* cylindrical, truncate or subclavate, about half the height of the sporangium. *Capillitium* black, spreading from the upper part of the columella in strong, rarely anastomosing, sparingly forked threads; the ultimate branchlets colourless. *Spores* grey, strongly echinulate with black spines, 15–20 μ diam.

On rotten wood. Pl. 310, fig. 2.

There is a specimen in the Kew collection, No. 642, from Rev. W. Colenso, New Zealand, received Dec. 1885. In this the sporangia reach 1 mm. diam., and have stout stalks; columella swollen, two-thirds the height of the sporangium; capillitium diffuse, cinereous. The specimen has been penetrated with mould, apparently at the time when the sporangia matured, which may have interfered with normal development. It is evidently *L. echinulatum* of Berkeley, with the remarkable spores peculiar to this species.

STEMONITIS SPLENDENS Rost. Sluzowc, p. 195; Karst. Myc. Fenn. iv. p. 122.—Peridiis cæspitosis, stipitatis, hypothallo fusco-atro insidentibus, cylindraceis, obtusis, fuscis, fugacissimis; columella apicem peridii fere attingente; stipite filiformi, nigro, nitido, longo; masculis capillitii superfacialibus sporâ triplo quadruplove majoribus; sporis levibus, 4–8 μ diam., intense vel subatro-fuscis.

Hab. supra ligna pinea in Fennia. Saccardo, Syl. Fung. p. 398.

A specimen in the Kew collection, No. 715, from Twycross, Bloxam ex parte Leighton, and one in the Greville collection at Edinburgh, both under the name of *S. fusca*, are the only examples I am acquainted with on which to claim this species as British; but it has probably been often overlooked on account of the superficial resemblance to *S. fusca*. The Kew collection contains an Italian specimen from Saccardo, with a gathering of *S. fusca* in the same paper, both under the latter name. It appears to be frequent in other parts of the world; at Kew there are five specimens from New Zealand, five from Australia, six from South Africa, one from New Guinea, four from Cuba, one from New Jersey, U.S.A.; these are under the names either of *S. fusca* Roth., *S. splendens* Rost., or *S. morgani* Peck., but all are embraced by the characters of Bloxam's specimen given below. I have typical forms of *S. splendens*, and also of *S. fusca*, gathered by J. J. Lister in the Pacific Islands in 1887.

Plasmodium ?, in rotten wood. *Total height* about 14 mm. *Sporangia* cylindrical, obtuse, purplish brown, closely aggregated, stipitate; the shining black stalks rising from a purplish hypothallus. *Columella* nearly reaching the apex of the sporangium. *Capillitium* (× 560) of purplish brown threads, the principal

branches usually springing distantly from the columella, at first almost simple, suddenly branching to form the superficial net, the meshes smooth, rounded but variously shaped, three to many times the diameter of the spores.* *Spores* nearly smooth, violet-brown, 7–9μ. Pl. 310, fig. 3.

As in *Stemonitis fusca*, this species appears to produce an æthalium form, which is represented in the Kew collection by No. 665, under the name of *Stemonitis confluens* Cke. & Ellis, from New Jersey.

Since writing the above I have gathered large quantities of *Stemonitis splendens* from several stumps of Scotch fir near Lyme Regis. The trees were felled three or four years ago, and the wood is hard. The white plasmodium emerged in large patches, several inches across, and was protected from sun and rain to insure perfect development. It is an unusual form, inasmuch as the stalks are very slender, rising from a silvery or purplish hypothallus, and with scanty, sparingly branched capillitium; the superficial threads are widely distributed, scarcely forming a net, and are occasionally connected with broad, membranous, and fringed expansions. The spores in mass are rich red-brown, when magnified 560 diam. violet-brown, and apparently smooth; but under a $\frac{1}{10}$ ob. g. a faint close reticulation can be discovered of the same character as is present in all the foreign gatherings of this species I have examined. The swarm-cells emerge in vast numbers when the spores have remained in water for two or three hours. Specimens gathered on stumps fifty yards apart have the capillitium and spores identical in all respects.

Reticularia Rozeana Rost. Mon. App. p. 33.—Æthaliis forma irregularibus, globatis, larga basi substrato adnatis, cortice, columellis, capillitio et massa sporarum æqualiter ferruginoso-fuscis, cortice tenui velut membrana, irregulariter confosso; capillitio ex filis tenuibus, transeuntibus in planas, membranæ similes dilatationes et in undique clausum reticulum junctis; sporis irregulariter sphæricis, valde verruculosis, 8 μ diam.

Hab. prope Paris Galliæ (Roze). Saccardo, Syl. Fung. p. 418.

Gathered by Prof. Bayley Balfour in Wanstead Park, Essex, July, 1887, in hollow stumps of Spanish chestnut, where it appeared in February and July, 1888, and in the summers of the two following years, always in small quantities; also by A. Camm near Birmingham, June, 1891, on rotten fir-wood. With characters as under :—

Plasmodium watery white, in decayed wood. *Æthalia* about 0·5 mm. broad, crowded, depressed, unequal in size, angled by mutual pressure, smooth; or confluent in small clusters, pitted and furrowed on the surface; together with capillitium and spores, rusty brown. Sporangium-wall membranous and iridescent, evanescent. *Capillitium* rising from a common hypothallus in broad membranous folds, more or less thickened by veins, and merging into a loose and scanty network above of more or less delicate

* The meshes in *S. fusca* are small, delicate, and angled, and the spores are reticulated × 1200.

threads. *Spores* (× 1200) pale brown, reticulated with narrow projecting bands, giving a spinose outline to the spore. Pl. 311, fig. 1.

In some specimens the delicate capillitium threads are almost wanting; the membranous folds approach the form of true sporangium-walls, and suggest an alliance with *Tubulina cylindrica*, to which the spores and other characters bear some resemblance.

A specimen apparently of this species, No. 983 in the Kew collection, from Westbrook, Maine, E. L. Bolles, under the name "*Reticularia echinospora*" M. A. B. is a pulvinate æthalium, 20 mm. broad, 5 mm. thick, with a smooth persistent wall; the membranous folds of capillitium are equally distributed through the æthalium; the spores are identical with those in the English gatherings of *R. Rozeana*.

Cornuvia depressa, n. sp.—*Plasmodium* white or rose-coloured, in rotten sticks, maturing at the point of emergence from the substratum. *Sporangia* (× 40) pulvinate, depressed, or effused plasmodiocarps, 2–10 mm. broad, about 0·3 mm. thick, brownish grey, somewhat shining. Sporangium-wall (× 560) a smooth translucent brownish membrane, thickened at the base. *Capillitium* profuse, pale umber; threads of unequal thickness; either 0·5 μ thick, hair-like, branching acutely, united to each other at the opposite ends or fasciculate; or 2 μ thick, straight, rigid; minutely serrulate, grooved, suddenly acuminate at each end, rising perpendicularly, and attached above and below to the sporangium-walls, which, when mounted in glycerine, are seen to be studded with the broken points. In some sporangia there are also a few straight rods, 60 μ long, 5 μ thick, rising from the basal wall, and branching at the apex in a brush of simple, straight, capillitium threads, equalling the length of the rod; intermediate forms may occur. *Spores* very pale, delicately spinose, 6–8 μ. Pl. 311, fig. 2.

On dead ash-sticks, in a mixed wood, and on the Undercliff, Lyme Regis, Dec. 1890.

In Broome's collection, British Museum, there are eleven specimens of this species, as under:—

1 named *Reticularia umbrina*,	from Rudloe,		Dec. 1843.
1 „ „	„	St. Catherines,	Feb. 1852.
1 „ *Licea ?*,	„	Batheaston,	Dec. 1863.
1 „ *Physarum metallicum*,	„	„	Jan. 1864.
7 „ *Lycogala epidendrum*,	„	„	Mar. 1869.

Sporangia which have developed from either white or red plasmodium are alike in all points, agreeing in this respect with *Trichia fallax*, which also has plasmodium of both colours.

I have named this species *Cornuvia* because of the similarity of the more delicate capillitium threads and the structure of the sporangium-wall with those of *Cornuvia metallica* R. The attachments of the capillitum to the sporangium-wall, which is so marked a feature, does not accord with Rostafinski's definition of the genus *Cornuvia*; but careful examination of *C. metallica* shows that even in this typical species the freeness of the capillitium cannot be con-

sidered a true character; more or less attachment of the threads can generally be discovered, and in some sporangia it is very evident. A specimen of *C. metallica*, No. 94, in Broome's collection, has the capillitium comparatively scanty, with branches attached to the wall almost as strikingly as in *C. depressa*. The extreme delicacy of the terminal threads usually renders the connection difficult of verification.

Rostafinski also gives the free capillitium as a distinguishing character of the genus *Prototrichia*, but this is quite at variance with the facts. *P. flagellifer* is found in considerable abundance in larch plantations at Lyme Regis, and in all the specimens I have examined, as well as in the type examples in Broome's collection, the tips of the threads are invariably attached to the sporangium-wall, which, when mounted, is seen to be studded with broken points in the same manner as in *C. depressa*; this is usually quite conspicuous, but in some sporangia with delicate walls, of the same structure as those of *C. metallica*, the attachment of the extremely slender tips of the threads is more difficult to trace.

Notwithstanding the spiral thickenings of the capillitium of *Prototrichia*, it would appear to be far removed from the genus *Trichia* in all other respects; on the other hand, the brush-like processes in *C. depressa*, so much resembling the otherwise unique habit of *Prototrichia flagellifer*, the very similar mode of attachment of the capillitium, and the identity in structure of the sporangium-wall, point to a near affinity between these two species. The spores of *Prototrichia* are precisely similar to those of *C. metallica*, and it would seem to be the most natural arrangement to unite *P. flagellifer*, *C. metallica*, and *C. depressa* under the genus *Cornuvia*, confining it to these three alone. *Cornuvia serpula* (Wigd.) Rost. and *Cornuvia circumscissa* Wall. have no apparent relationship to these three; the former is allied to *Hemiarcyria*, and the latter is a true *Perichæna*.

The division of *P. flagellifer* into two or more species on account of small differences in the roughness of the spores is scarcely justifiable. The same variation is seen in *C. metallica*. The capillitium, though slightly varying in different gatherings, is essentially the same in all. Changes of temperature often cause considerable modifications: in specimens collected in the cold spring of this year, one sporangium contains capillitium with no spiral thickenings; in another, a part of the threads have formed a network with flattened and perforated expansions.

PERICHÆNA VERMICULARIS (Schw.) Rost. Mon. App. p. 34. *Physarum vermiculare* Schw. Am. n. 2296. — Plasmodiis venulosis, arcuatis, angustis, repentibus, aliquando reticulate junctis, pallidebadiis; massa capillitii et sporarum subgilva; capillitio bene evoluto, cum floccis serrulatis, 1·6 μ latis; sporis 10–11 μ diam.

Hab. ad cortices in Carolina. Saccardo, Syl. Fung. p. 421.

Gathered in some abundance among dead leaves in a wood near Lyme Regis in January, 1889, and January, 1890; also in a leaf-heap at Highcliff, Lyme Regis, in May, 1891. With characters as under:—

Plasmodium ?, among dead leaves. *Sporangia* (× 40) spherical, 0·5 mm. diam., on a narrow base, or vermiform or net-like plasmodiocarps, 3–4 mm. broad, dull yellow, smooth. Sporangium-wall (× 560) single, membranous, and evanescent above, pale yellow, closely beset with minute papillæ; the base ochraceous, thickened, and containing angular granules. *Capillitium* profuse, forming a net of yellow, sparingly branched threads, 2–4 μ diam., rough with irregular points and constrictions, sometimes swollen at the angles, 8 μ. *Spores* yellow, minutely warted, 10–15 μ. Pl. 311, fig. 3.

Dead leaves.

The capillitium varies in different gatherings. The threads in sporangia which have developed under favourable conditions are narrow and but slightly expanded at the angles of the branches; in those which have matured in cold weather the threads are more irregular, and have many vesicular swellings enclosing refuse matter.

There is a small specimen of this species in Broome's collection at the British Museum, No. 310, from Batheaston, Feb. 25th, 1869, "on a cabbage-stalk," under the name of "*Ophiotheca chrysosperma*" (syn. *Cornuvia circumscissa* (Wallr.) Rost.).

Specimen No. 990 in the Kew collection, under the name of *Perichæna Friesiana* R., from Ellis, New Jersey, is identical with the Lyme Regis gatherings; capillitium 1·5–3 μ, spores 10–13 μ. It may be doubtful whether there is a specific difference between the two forms, *P. Friesiana* R. and *P. vermicularis* Schw. R., given in Saccardo; but the description of *P. vermicularis* so accurately defines these specimens that I venture to adopt it in preference to the former name, which would appear to have been applied to a single gathering only, and of which the characters given by Rostafinski are not correct for the Kew example.

Arcyria Oerstedtii Rost. Mon. p. 278. — "Peridiis ovatis, in formis typicis, stipitatis; stipitibus brevibus rectis; capillitio multototies diviso, dein evanescente; massa sporarum et capillitii nucea, subfusca, coccineo-fusca aut e fusco-nigricante; reticulo capillitii e tubis cylindricis, incisuram habentibus, subulatis 3·3 ad 5 μ latis, sæpe valde vesiculoso-inflatis formato; protuberantis tantum aculeos laxe disseminatos variæ attitudinis sistentibus; sporis levibus, 8–9 μ diam.

"Hab. prope Petersburg Rossiæ et Pinzgan Tyroliæ, nec non ad Kopenhaghen Daniæ." Saccardo, Syl. Fung. p. 431.

Found in some abundance at Clevelands, near Lyme Regis, in Oct. 1887, Nov. 1888, and Jan., 1889; also gathered by A. Camm near Birmingham, Sept. 1890. With characters as under:—

Plasmodium white, in the sound wood of fir-log. *Sporangia* (× 40) crowded, cylindrical, complicate, stipitate, 0·6–1·5 mm. in length, 0·3–0·5 mm. diam., dull crimson. Sporangium-wall (× 560) membranous, nearly colourless, evanescent, with the exception of the basal cup, and also of certain shield-like, well-defined, persistent portions of the upper wall, which, as well as the cup, are papillose, with a smooth margin; to these shields the capillitium is attached

at numerous points. *Stalk* varying in length, usually very short, filled with spore-like cells. *Capillitium* a loose net of variously branching threads, which expand on drying into a dull red column four times the length of the sporangium or more, either free from or with few attachments to the cup. Threads (× 560) nearly terete, 3–5 μ diam., more or less evenly beset with sharp spines varying from 1 to 3 μ. *Spores* smooth, pale red, 7·8 μ. Pl. 312, fig. 1.

On sawn end of fir-log in wood-stack. In some sporangia the threads of the capillitium are uneven, with constrictions and fusiform expansions, 7–8 μ diam.

A specimen from Denmark, No. 893 in the Kew collection, named by Dr. Cooke *Arcyria Oerstedtii*, consists only of capillitium, and, though somewhat darker in colour, is no doubt the same species as my gatherings, as is also No. 154, from New Zealand, named *Hemiarcyria fuliginea* C. & M. This, again, is more fuliginous in tint, but in all other respects, including the persistent portions of the sporangium-wall, it is precisely the same as the English gatherings. I cannot doubt that Dr. Cooke is right in his naming of the Denmark specimen, but all the examples are so closely allied to *Arcyria nutans* Bull. that it is a question whether *A. Oerstedtii* is not merely a well-marked variety of that species. In *A. nutans* the sporangium-wall above the basal cup is nearly always evanescent, but in rare instances a persistent fragment may be found; the capillitium is variable, and in some sporangia it is essentially similar to *A. Oerstedtii*. The real distinction, therefore, would appear to resolve itself into one of colour, and, bearing in mind the brown and ochraceous forms which are met with in *A. ferruginea*, the question of colour can scarcely be held to be of specific importance.

Hemiarcyria Karstenii Rost. Mon. i. p. 41; Karst. Myx. Fenn. iv. p. 142; Schroet. Krypt. Fl. Schles Pilze, p. 115.—"Peridiis effusis vermiformibus, serpentibus, subinde reticulatim junctis, umbrino-castaneis; tubulis capillitii, 3-4 μ crassis, hinc inde inflatis, usque ad 12 μ crassis; tæniolis spiralibus, 3 vel pluribus, leviter prominentibus interstitiis earum latitudine, apicibus haud distincte attenuatis, truncatis vel clavato-incrassatis; sporis sphæroideis, levibus, 10–12 μ diam.

"Hab. ad lignum præcipue acerinum vetustum in regione Aboënsi, Fenniæ, Silesiæ et pr. Peradenya in insula Ceylon. Peridia usque ad 4 mm. longa, circiter 300 μ crassa." Saccardo, Syl. Fung. p. 448.

Gathered by A. Camm at Dudley Castle, Nov. 11th, 1890, on fallen branches. With characters as under:—

Sporangia (× 40) hemispherical 0·5 mm. diam., or vermiform winding plasmodiocarps, 3–6 mm. in length, 0·4–0·5 mm. broad; dark purplish brown, irregularly dehiscing along the central line. Sporangium-wall (× 560) thickened with subcrystalline deposits. *Capillitium* yellowish brown, sparingly branched; threads 3–4 μ thick, with distant rings and vesicular expansions, 10–12 μ; spirals 3–4 faintly marked; the free ends obtuse, scarcely swollen,

occasionally short and spine-like. *Spores* yellow, very minutely warted, spherical or subelliptical, 13–15 μ. Pl. 312, fig. 2.

Specimen No. 132 in the Kew collection, from Weybridge, Dec. 1859, under the name *H. paradoxa* Mass., only differs from the above in the colour being dull brownish yellow, in having less frequent vesicular swellings in the capillitium, and in the spores measuring 11–12 μ, corresponding more with the description given by Schroeter, Krypt. Fl. v. Schl. 50, p. 115.

Hemiarcyria intorta, n. sp.— *Plasmodium ?*, in rotten wood. *Total height* 1–1½ mm. *Sporangia* (× 40) turbinate, yellow or olive-yellow, shining, 0·3–0·7 mm. diam., aggregate or scattered, stipitate. Sporangium-wall (× 560) yellow, membranous above, thickened with granular deposits towards the base, papillose on the inner side. *Stalk* purplish brown, glossy, 0·5–0·7 mm. in length, 0·15 mm. diam. in the middle, thickened above and below, with 2–4 broad longitudinal furrows; solid. *Capillitium* a twisted tangle of orange-yellow threads, sparingly branched, with few obtuse, scarcely swollen free ends; more or less attached to the sporangium-wall below; threads 4 μ diam., densely spinulose or nearly smooth; spiral bands 4–5, close, more or less distinct, longitudinal striæ sometimes present between the spirals. *Spores* yellow, minutely warted, 9–10 μ. Pl. 312, fig. 3.

In considerable abundance on decayed elm-log. Hitchin, March, 1889, and Jan. 1890; gathered also by A. Camm near Birmingham, Oct. 1889.

The threads of the capillitium vary in the distinctness of the spirals, and in the spinulose character in different sporangia; they are very elastic, and may be drawn out three or four inches without a branch, recoiling to a closely twisted tangle. The cavity of the sporangium is separated from the solid stalk by a cup-shaped membranous layer of the inner wall.

Leytonstone, July, 1891.

Explanation of Plates.

c. capillitium; *k.* lime-knots = vesicular expansions of the capillitium filled with granules of calcium carbonate; *s.* sporangium; *sp.* spores; *w.* wall of sporangium.

Plate 308.—1. *Physarum psittacinum* Ditm. 2. *P. calidris*, n. sp. 3. *P. rubiginosum* Fr.

Plate 309.—1. *Physarum conglomeratum* (Fr.) Rost. 2. *P. Diderma* Rost. 3. *P. Braunianum* de Bary.

Plate 310.—1. *Didymium dubium* Rost. 2. *Lamproderma echinulatum* Berk. 3. *Stemonitis splendens* Rost.

Plate 311.—1. *Reticularia Rozeana* Rost. 2. *Cornuvia depressa*, n. sp. 3. *Perichæna vermicularis* Schw.

Plate 312.—1. *Arcyria Oerstedtii* Rost. 2. *Hemiarcyria Karstenii* Rost. 3. *H. intorta*, n. sp.

THE FLORA OF STEEP HOLMES.

By the Rev. R. P. Murray, M.A., F.L.S.

[It may be interesting to prefix to this List the following extracts from Lightfoot's MS. *Journal of a Botanical Excursion in Wales* in 1775, which is preserved in the Botanical Department of the British Museum.

"Saturday, July 3. Upon the Steep Holmes the following:—*Smyrnium Olusatrum* and *Ligustrum vulgare* are the predominant plants upon the top of the island, which totally cover it. A little of the *Conium maculatum* is mixed with it.

"Upon the rocks on the south side grow *Inula crithmoides*, *Crithmum maritimum*, *Statice Limonium*, *Asplenium marinum*; *Lavatera arborea* in inaccessible places near the top of the rocks.

"*Allium Ampeloprasum:* near the stone gateway at the landing-place. *Euphorbia Lathyris:* Mr. Banks found one plant of it upon the island. *Geranium* (*Erodium*) *maritimum* not so plentifully as at the Flat Holmes."

Banks visited the island in 1773, as is shown by a specimen of *Inula crithmoides* collected by him, bearing that date in the British Museum Herbarium. For this, of course, Mr. Murray and his friends were too early.—Ed. Journ. Bot.].

The following list is the result of a short visit (about four hours) paid to the Steep Holm in June last. The botanists who took part in it were the Rev. T. Allin, Rev. R. P. Murray, and Mr. James W. White. As a record of the existing vegetation of an islet seldom visited by botanists, we think that the list will not be without interest. We have noted no plant which we did not actually see growing on the island. Our list, therefore, cannot be a complete one, but we think the additions which more extended research might enable us to make would not be very numerous. In 1887 Mr. T. B. Flower visited the island, and has recorded *Fumaria officinalis*, *Brassica oleracea*, *Lavatera arborea*, *Coriandrum sativum* (naturalised), *Inula crithmoides*, *Statice occidentalis*, and *Euphorbia Lathyris*. For most of these species we were probably too early; nor did we see *Ophrys apifera*, which is said by the lessee to be very common. Probably the entire vegetation of the island (flowering plants and higher cryptogams) does not much exceed 150 species. *Ranunculus acris*, *R. repens*, *R. bulbosus*, *Pæonia corallina*. The pæony seemed to be confined to one spot, at the edge of a precipice. We were told that plants now and then spring up elsewhere, and one or two were seen at a little distance from the main patch. Probably the whole number is under twenty. All were in fruit, each with from two to four well-developed follicles. The lessee of the island now exercises some control over excursionists, and discourages spoliation. *Papaver dubium*. *Fumaria pallidiflora*, two or three plants in a deserted garden. *Cheiranthus Cheiri*, on rocks. *Erophila vulgaris*, *Cochlearia officinalis*, *Sisymbrium officinale*, [*Brassica Rutabaga*], *B. Sinapis*, *Diplotaxis muralis*, *Capsella*

Bursa-pastoris, *Senebiera Coronopus*. *Viola sylvatica*, sparingly in rock crevices. *Polygala vulgaris*, *Silene Cucubalus*, *S. maritima*, *Lychnis alba*. *Cerastium pumilum*, in plenty on rocks facing the south, a situation usual with this species. *C. semidecandrum*, *C. glomeratum*, *C. triviale*, *Arenaria serpyllifolia*, *Sagina apetala*, *Hypericum montanum*, *Linum catharticum*, *Geranium molle*, *G. Robertianum*, *Erodium cicutarium*. *E. maritimum*, rare. *Acer Pseudo-platanus*, two or three small trees not far from the landing-place ; the only timber in the island. *Medicago lupulina*, *Trifolium pratense*, *T. procumbens*, *T. dubium*, *Anthyllis Vulneraria*, *Lotus corniculatus*. *Vicia hirsuta*, in great abundance. *V. sativa*. *Rubus rusticanus*, no other form seen. *Fragaria vesca*, *Rosa dumalis*. *Cratægus Oxyacantha*, two or three dwarfed bushes not more than a foot high. *Cotyledon Umbilicus*, *Sedum acre*. *Conium maculatum*, very plentiful. *Smyrnium Olusatrum*, forms a very prominent feature in the vegetation, being especially fine and abundant. *Carum Petroselinum*, *Pimpinella Saxifraga*, *Crithmum maritimum*, *Peucedanum sativum*. *Heracleum Sphondylium*, one plant. *Hedera Helix*, *Sambucus nigra*, *Rubia peregrina*, *Galium verum*, *G. Mollugo*, *G. Aparine*, *Sherardia arvensis*, *Centranthus ruber*, *Dipsacus sylvestris*, *Bellis perennis*, *Inula Conyza*, *Chrysanthemum Leucanthemum*, *Senecio vulgaris*, *S. Jacobæa*, *Carlina vulgaris*, *Arctium* sp., *Carduus nutans*, *Cnicus lanceolatus*, *C. arvensis*, *Picris echioides*. *Hieracium Pilosella*, a form with upper part of the scape and phyllaries nearly black with glandular hairs, was conspicuous. *Hypochæris radicata*, *Leontodon hispidus*, *L. autumnalis*, *Taraxacum officinale*, *T. erythrospermum*, *Sonchus oleraceus*, *Armeria maritima*, *Primula veris*. *Ligustrum vulgare*, in plenty on rocks and cliffs ; undoubtedly native. *Blackstonia perfoliata*, *Cynoglossum officinale*, *Myosotis arvensis*, *M. collina*. *Hyocyamus niger*, several plants. *Verbascum Thapsus*, *Antirrhinum majus*, *Scrophularia nodosa*, *Veronica arvensis*, *V. Chamædrys*, *V. Buxbaumii*, *Calamintha officinalis*, *Nepeta Glechoma*. *Marrubium vulgare*, common. *Lamium amplexicaule*, in a small garden plot ; plentiful. *Teucrium Scorodonia*, *Plantago lanceolata*, *P. Coronopus*, *Chenopodium album*, *Beta maritima*, *Atriplex Babingtonii*, *Polygonum aviculare*, *Rumex crispus*, *R. Acetosa*, *Mercurialis perennis*. *Urtica dioica*. *U. urens*, sparingly. *Parietaria officinalis*. *Iris fœtidissima*, abundant, just as on Brean Down. *Allium Ampeloprasum*, in plenty on a rocky slope ; of course not yet in bloom. *Scilla nutans*, common ; several plants were seen on the exposed summit of the island. *Arum maculatum*, *Avena pubescens*, *Arrhenatherum avenaceum*, *Dactylis glomerata*, *Briza media*, *Poa annua*, *P. pratensis* and *β. subcærulea*, *Festuca rigida*, *F. ovina*, *F. fallax*? *Bromus erectus*, the most common grass. *B. sterilis*, *B. mollis*, *Brachypodium sylvaticum*, *Lolium perenne*, *Asplenium Adiantum-nigrum*, *A. Trichomanes*, *A. Ruta-muraria*, *Scolopendrium vulgare*, *Polypodium vulgare*.

SOME BRITISH HAWKWEEDS.

By Edward F. Linton, M.A.

The following notes refer chiefly to Hawkweeds noticed in England during the summer of 1890, with which are included one or two Welsh localities, and two Scotch Hieracia hitherto apparently undescribed:—

Hieracium Marshalli, n. sp. Discovered by the Rev. E. S. Marshall on rocks by the Unich Water Forfar, in 1888, who drew my attention to it, and by his direction I gathered it in 1889, with my brother, along the same stream. The following description was taken from plants in the fresh state gathered in July, 1890, in the same locality:—Rootstock elongate; root-leaves ciliate, original roundly ovate, later ovate-acuminate, yellowish green, rough with hairs beneath, rather fleshy above, moderately dentate below, and narrowed into a winged petiole clothed with long silky hairs extending up the midrib; stem-leaf one, similar to root-leaves, but shortly petioled or sessile when high up; all the leaves with dark purple tips; stem 6 to 16 in. high, with scattered white hairs below, floccose above, few-flowered; peduncles floccose (very floccose in cultivation), with several short black glandular hairs, and some black-based long white hairs; heads large, rounded below, slightly constricted, clothed with long white black-based hairs, moderately glandular; phyllaries dark olive-green, outer rather lax, inner adpressed, broad, usually acute or triangular at tip, tip purplish or purplish black, very senescent. Flowers bright golden-yellow, moderately large, with ligules pilose at the tip, and styles livid yellow, darkened by short black hair. Plants growing on bare rock are not only dwarfed in size, but have only one head, no stem-leaf, and root-leaves clothed above with bulbous-based hairs. So far, this species has not been recognised elsewhere; but Mr. F. J. Hanbury has shown me in cultivation a root he collected in Argyle, which scarcely differs from *H. Marshalli*, except in the narrower and more dentate leaves, and the more glandular heads, and which should therefore be placed here.

H. Schmidtii Tausch. Abundant on steep slopes at Cheddar. Style pure yellow. New record for North Somerset.

H. Pictorum, n. sp. I gathered this first in 1889, near the Unich Water Fall, Forfar; and soon after on the rocks of Little Craigindal, South Aberdeen; again, in 1890, the Rev. Wm. R. Linton and I gathered it frequently in the Clova district, at three or four different points, eight or nine miles apart. My description is taken from Forfarshire specimens, examined while still fresh for the purpose:—Rootstock short on rock, or long on *débris;* root-leaves marked by prominent nerves, ovate to ovate-acuminate underneath, denticulate throughout, and often sharply dentate at the base, narrowed suddenly into a slightly winged hairy petiole, glabrous and pale green above, subglabrous, except on midrib, and paler below, gradually suffused with a violet-purple colour which spreads from the dark purple tip of the blade of the leaf; stem

1–1½ ft., subglabrous, with few adpressed hairs, becoming floccose upwards, sometimes with one shortly-stalked dentate ovate-acuminate leaf, more often leafless, with few large heads at higher elevations, or many in low valleys; peduncles slightly floccose, and moderately glandular; heads ovoid, ventricose, clothed with short black hair and setæ; phyllaries, outer blackish green, subulate, inner olive-green shading into pale purple, acuminate, senescent at the tip more or less, but not markedly; ligules of gamboge-yellow, glabrous upwards; styles olive-yellow, discoloured with short dark hair, their florets usually brownish yellow; pappus greyish white. Besides the Forfarshire and Aberdeenshire plants above mentioned, I have seen about half-a-dozen specimens collected by Mr. F. J. Hanbury on Clach Leathad, Argyle, and a specimen gathered by the Rev. E. S. Marshall in Glen Falloch, Perthshire; but beyond this district of the central Highlands of Scotland, formerly the domain of the tribe that reached Britain of the ancient race of Picti, we have not as yet detected this distinct-looking species. (Since writing the above this species has been gathered by the Rev. W. R. Linton and myself in Glen Lyon, and on rocks north of Ben Lawers, Mid-Perth 88.)

H. STENOLEPIS Lindeb. Very fine, but not plentiful, on the steep slopes under cliffs in the gorge at Cheddar; preferring a north aspect, whereas *H. Schmidtii*, which was a week or two later in flowering, was most plentiful on steep slopes facing south. New to Somerset North.

H. DIAPHANUM Fries. Gathered as long ago as 1874, at Longridge, in West Lancaster, and laid in with my set of *H. vulgatum* as a form, but unrecognised till I heard of Mr. J. C. Melvill's discovery of this species; and I then satisfied myself, by comparison with Dr. Lindeberg's type in Hier. Scand. Exs. (No. 35) and Fries' description, that my Longridge specimens were *H. diaphanum* exactly. The phyllaries on my plant are rather more finely acuminate and finally subacute than is the case with Dr. Lindeberg's specimen, in this agreeing with the description the better; otherwise the plants might have grown on the same bank. This species is most likely to be confused with *H. vulgatum* Fr. or *H. diaphanoides* Lindeb. It differs from the former by its membranous leaves, and broad glandular blackish green phyllaries, which are devoid of white hairs and eventually of floccose down; and from the latter by its narrower leaves denticulate rather than dentate, the greater breadth of its phyllaries, and the yellow style.

H. DIAPHANOIDES Lindeb. The Rev. R. P. Murray called my attention to a Hawkweed on a rocky bank at Mangotsfield Station, in July, 1890, and, as my train which was due to start did not move, I was able to gather several specimens with a root or two, which proved to be this species. A few days afterwards I was waiting at Conway Station with Mr. J. E. Griffith, and we found a similar rocky bank just through the tunnel at the end of the platform covered with *H. diaphanoides*. With Mr. Griffith I also found it on rocks near Llyn Ogwen, and alone near Tregarth and Bethesda. I believe these are both new to their counties (*viz.*, West Gloucester

34, and Carnarvon 49). *H. diaphanoides* was also sent me last autumn by Mr. J. W. White, unnamed, gathered by him on Congleton Edge, North Staffordshire.

H. ORARIUM Lindeb. Roots that I have taken of a Hawkweed from the St. Vincent's Rocks, W. Gloucester, and from Dovedale, Derbyshire, which I suspected to differ from *H. vulgatum*, have proved under cultivation to be *H. orarium;* Mr. F. J. Hanbury and the Rev. E. S. Marshall have both come to the same opinion by comparison of the living plants in my garden. Here, too, must be placed a plant I gathered in July, 1890, with Mr. J. E. Griffith, near Bethesda, Carnarvon. Cultivation has proved what might have remained uncertain with the wild specimens alone to go by. The same plant was gathered by us in the Penrhyn slate-quarries.

THE ALGÆ OF THE CLYDE SEA AREA.

(Concluded from p. 236.)

SERIES RHODOPHYCEÆ.

Cohort PORPHYRINÆ.†

Order PORPHYRACEÆ.

BANGIA Lyngb.

B. fusco-purpurea Lyngb. Cumbrae! D. R. Girvan! D. R. Gourock, M. Bute, Arran, Portincross, Landsb. Brit. Seaw. p. 325. Saltcoats! Herb. Landsb.

ERYTHROTRICHIA Aresch.

E. carnea J. Ag. = *Bangia ceramicola* and *B. carnea* of Mahoney's list = *Conferva ceramicola* Landsb. list. Cumbrae. Saltcoats! Herb. Landsb. Largs, Portincross, Corriegills, Herb. Glnsg. Univ. Arran, M. In my own herbarium there is a beautiful specimen of this species gathered at Ardrossan by Dr. Landsborough in 1852.

PORPHYRA Ag.

P. laciniata Ag. Port Glasgow! D. R. Skelmorlie! D. R. Arran, Landsb.

**P. miniata* J. Ag., not *Diploderma miniatum* Kjellman. In Mr. King's herbarium there is a *Porphyra* from Kildonan which exactly resembles *Diploderma miniatum* Kjellm., both in colour and size; but a transverse section of the frond shows that it is monostromatic, with large square cells, and a thickness of 25–30 μ; whereas *D. miniatum* is diplostromatic, with a thickness, so far as I have observed, of about 60 μ. J. G. Agardh, in Alg. Syst. 3, p. 60, describes a monostromatic species under the name *Porphyra miniata*, and I have little doubt that the Kildonan plant is identical with Agardh's, but not with Kjellman's species.

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† I have placed the *Porphyrinæ* in the series *Rhodophyceæ* more for the sake of convenience than from any belief that this is its true systematic position.

P. linearis Grev. = *P. vulgaris* Phyc. Brit. *pro parte*. Arran, Landsb. Kirn, Kilcreggan, Gourock, Port Glasgow, Herb. Glasg. Univ.

Cohort Nemalioninæ.

Order Helminthocladiaceæ.

Tribe Chantransieæ.

Chantransia Fries.

C. Daviesii Thur. Largs, rare, Grev. in Herb. Glasg. Univ.

C. virgatula Thur. Skelmorlie! D. R. Cumbrae! D. R.

Tribe Nemalieæ.

Nemalion Targioni-Tozzetti.

**N. multifidum* J. Ag. Bute! D. R.

Helminthora J. Ag.

H. divaricata J. Ag. = *Dudresnaia Hudsoni* et *D. divaricata* M. Brodick Bay! D. R. Saltcoats, Herb. Brit. Mus. Ardrossan! Herb. Landsb.

Order Chætangiaceæ.

Tribe Scinaieæ.

Scinaia Bivona.

S. furcellata Bivona = *Ginnania furcellata* Phyc. Brit. Cumbrae! D. R. Common, M. Lamlash, Corriegills, Landsb. Brit. Seaw. p. 229.

**S. furcellata* Bivona, f. *subcostata* J. Ag. Cumbrae! D. R. in Herb. Batters.

Order Gelidiaceæ.

Tribe Wrangelieæ.

***Naccaria Endl.**

**N. Wigghii* Endl. Ayr Heads! D. R. Macrehanish Bay! Herb. Landsb.

Tribe Gelidieæ.

Gelidium Lamx.

G. corneum Lamx. f. *latifolia* Grev. Cumbrae! D. R. Girvan! D. R. Bute! Herb. Shuttleworth in Brit. Mus.

N.B.—In Mrs. Robertson's collection there is a specimen of *Gelidium cartilagineum* Gaill., which was washed up at Cumbrae.

Cohort Gigartininæ.

Order Gigartinaceæ.

Tribe Gigartineæ.

Chondrus J. Ag.

C. crispus Stack. Cumbrae! D. R. Ailsa! D. R. Arran, Landsb. Ardrossan, Portincross, Herb. Landsb.

Gigartina Stack.

G. mamillosa J. Ag. = *Chondrus mammilosus* Landsb. List. Cumbrae! D. R. Innellan! T. King. Arran, Landsb.

Tribe Tylocarpeæ.

Phyllophora Grev.

P. rubens Grev. Cumbrae! D.R. Holy Isle, M. Arran, Landsb. Bute, Herb. Glasg. Univ.

P. Brodiæi J. Ag. = *Chondrus Brodiæi* Landsb. List. Cumbrae! D. R. Arran, Landsb.

P. membranifolia J. Ag. = *Chondrus membranifolius* Landsb, List. Cumbrae! D. R. Arran, Landsb.

Gymnogongrus Mart.

**G. norvegicus* Herb. Brit. Mus.

Ahnfeltia Fries.

A. plicata Fries. Ayr Heads! D. R. Common, M.

Actinococcus Kütz.

**A. roseus* Kütz. On *Phyllophora Brodiæi* J. Ag. from Cumbrae! in Mrs. Robertson's Herbarium.

Tribe Callymenieæ.

Callophyllis Kütz.

C. laciniata Kütz. = *Rhodymenia laciniata* Phyc. Brit. Campbletown! Cumbrae! D. R. Kildonan! T. King.

Order Rhodophyllidaceæ.

Tribe Cystocllonieæ.

Cystoclonium Kütz.

C. purpurascens Kütz. Common, M. Saltcoats, Ardrossan, Lamlash, Herb. Glasg. Univ. Kildonan! T. King.

**C. purpurascens* Kütz. f. *cirrhosa* J. Ag. Cumbrae! D. R.

Catenella Grev.

C. Opuntia Grev. Cumbrae! D. R. Common, M.

Tribe Rhodophyllideæ.

Rhodophyllis Kütz.

R. bifida Kütz. Common, M. Saltcoats, Kilbride, Johnstone & Croall, ii. p. 15. Ardrossan, Lamlash, Herb. Glasg. Univ.

**R. appendiculatus* J. Ag. = *R. bifida* f. *ciliata* Phyc. Brit. Cumbrae! Landsb. Brit. Seaw. p. 245.

Cohort Rhodymeninæ.

Order Sphærococcaceæ.

Tribe Sphærococceæ.

Sphærococcus Grev.

S. coronopifolius Grev. Frequent. Cumbrae, M. W. Kilbride, Ardrossan, Herb. Glasg. Univ. Arran, Landsb. Brit. Seaw. p. 242.

Tribe Gracilarieæ.

Gracilaria Grev.

G. confervoides Grev. Cumbrae! D. R. Common, M.

Calliblepharis Kütz.

C. jubata Kütz. Helensburgh! D.R. Cumbrae! D. R. Arran, M.

**C. ciliata* Kütz. Cumbrae, Major Martin. Arran, Landsb., Johnstone & Croall, i. p. 145.

Order Rhodymeniaceæ.

Tribe Rhodymenieæ.

Rhodymenia J. Ag.

R. palmata Grev. Helensburgh! D. R. Innellan! T. King. Common, M. Saltcoats, Portincross, Herb. Glasg. Univ.

R. palmata Grev. f. *sobolifera* J. Ag. Arran! Herb. Lyon in Brit. Mus. et Herb. Landsb.

Lomentaria Lyngb.

L. articulata Lyngb. = *Chylocladia articulata* Phyc. Brit. Cumbrae! D. R. Ardrossan, Herb. Brit. Mus.

L. clavellosa Gaill. = *Chrysymenia clavellosa* Phyc. Brit. Shoals Buoy! D. R. Cumbrae! D. R. Kildonan! Herb. King. Bute, Herb. Brit. Mus. Ardrossan, Herb. Lyon in Brit. Mus.

Champia Lamx.

C. parvula Harv. Corriegills, Cumbrae, R. H. in Herb. Glasg. Univ. Recorded in Mahoney's List, but without locality.

Chylocladia Grev.

C. kaliformis Hook. = *Lomentaria kaliformis* Mahoney's List. Kildonan! T. King. Bute, Herb. Shuttleworth, Brit. Mus. "Common," M. Wemyss Bay, Gourock, Rothesay, Brodick, Corriegills, Herb. Glasg. Univ.

C. ovalis Hook. Rare. Dunoon, M.

Tribe Plocamieæ.

Plocamium Lyngb.

P. coccineum Lyngb. Girvan! Ardrossan! D. R. Kildonan! T. King. Common, M.

Order Delesseriaceæ.

Tribe Nitophylleæ.

Nitophyllum Grev.

N. laceratum Grev. Cumbrae! D. R. Kildonan! T. King.

N. punctatum Grev. Cumbrae! D. R. Kildonan! T. King. Bute, Herb. Shuttleworth. Saltcoats, Herb. Brit. Mus. Ardrossan, Bute, Herb. Glasg. Univ.

N. Bonnemaisonii Grev. Rare. Arran, M. Bute, Herb. Cutler; Grev. Crypt. Fl. p. 322, sub *Delesseria*.

Tribe Delesserieæ.

Delesseria Lamx. = Wormskioldia Mahoney's List.

D. alata Lamx. Cumbrae! D. R. Kildonan! T. King. Ardrossan, Herb. Lyon, Brit. Mus.

D. hypoglossum Lamx. Cumbrae! D. R. Kildonan! T. King. Innellan, M. Arran, Bute, Herb. Glasg. Univ.

**D. hypoglossum β. angustifolia* Kütz. Cumbrae! D. R.

D. ruscifolia Lamx. Arran, rare, M.

D. sinuosa Lamx. Cumbrae! D. R. Toward, near Dunoon, T. King. Kildonan! T. King. Ardrossan! Herb. Landsb.

HYDROLAPATHUM Stackh.

H. sanguineum Stackh. = *Wormskioldia sanguinea* M. Cumbrae! D. R. Ayrshire coast! D. R. Kildonan! T. King. Saltcoats! Herb. Landsb.

Order BONNEMAISONIACEÆ.

BONNEMAISONIA Ag.

B. asparagoides Ag. Cumbrae! D. R. Kildonan! T. King. Saltcoats, Ardrossan, Invercloy; Arnott in Herb. Brit. Mus. Arran, Landsb.

Order RHODOMELACEÆ.

Tribe RHODOMELEÆ.

RHODOMELA Ag.

R. subfusca Ag. Bute, Herb. Shuttleworth. Common, M. Wemyss Bay, Portincross, Herb. Glasg. Univ.

R. lycopodioides Ag. Cumbrae! D. R. Saltcoats, Ardrossan, Herb. Cutler.

ODONTHALIA Lyngb.

O. dentata Lyngb. Cumbrae! D. R. Kildonan! T. King. Kilbride shore, Ayrshire, Major Martin, Herb. Brit. Mus. Saltcoats and Ardrossan! Herb. Cutler et Landsb.

Tribe LAURENCIEÆ.

LAURENCIA Lamx.

**L. obtusa* Lamx. Girvan! D. R. Ardrossan, Arran, Herb. Brit. Mus. Corriegills, Portincross, Herb. Glasg. Univ.

L. hybrida Lenorm. = *L. cæspitosa* Phyc. Brit. Cumbrae, M.

L. pinnatifida Lamx. Cumbrae! D. R. Girvan! D. R. Kildonan! T. King. Arran, M. Portincross, Herb. Glasg. Univ.

**L. pinnatifida* f. *uncinata* Grev. Cumbrae, Grev. in Herb. Glasg. Univ.

Tribe POLYSIPHONIEÆ.

CHONDRIA Harv.

C. dasyphylla Ag. Frequent, Cumbrae, M.

C. tenuissima Ag. = *Laurencia tenuissima* Phyc. Brit. Lamlash Bay, Arran, Landsborough's Arran, p. 179.

POLYSIPHONIA Grev.

a. OLIGOSIPHONIÆ ECORTICATÆ.

**P. sertularioides* J. Ag. = *P. pulvinata* Phyc. Brit. Ailsa! D. R. Saltcoats, Ardrossan, Herb. Brit. Mus. Cumbrae, Herb. Glasg. Univ.

P. fibrata Harv. Cumbrae! D. R. Bute, Herb. Shuttleworth. Arran, Herb. Brit. Mus. Corriegills, Herb. Glasg. Univ.

P. urceolata Grev. Skelmorlie! D. R. Kildonan! T. King. Bute, Herb. Shuttleworth. Ardrossan, Herb. Lyon in Brit. Mus.

P. urceolata f. *patens* J. Ag. Cumbrae! D. R. Kildonan! T. King.

P. urceolata f. *formosa* J. Ag. Common, M. Gourock, Herb. Glasg. Univ.

β. Oligosiphoniæ corticatæ.

P. elongella Harv. Kerritonlia Buoy, near Rothsay! D. R. Ardrossan! Saltcoats! Herb. Landsb. Kirn, Lamlash, Herb. Glasg. Univ.

P. elongata Grev. Cumbrae! Kildonan! T. King, Ardrossan, Herb. Lyon, Brit. Mus. Bute, Herb. Shuttleworth. Lamlash, Brodick, Portincross, Kirn, Gourock, Wemyss Bay, Herb. Glasg. Univ.

P. violacea Grev. Cumbrae! D. R. Holy Isle, M. Corriegills, Herb. Glasg. Univ.

P. fibrillosa Grev. Bute, Herb. Shuttleworth in Brit. Mus. Arran, Landsb. Saltcoats! Herb. Landsb. Cumbrae, Dunoon, Herb. Glasg. Univ.

γ. Polysiphoniæ ecorticatæ.

P. fastigiata Grev. Cumbrae! D. R. Kildonan! T. King.

P. atro-rubescens Grev. Port Glasgow! D. R. Arran, Landsb.

**P. subulifera* Harv. Lamlash Bay, Mrs. Balfour, Johnstone & Croall, i. p. 57.

P. nigrescens Grev. Cumbrae! D. R. Wemyss Bay! D. R. Kildonan! T. King. Bute, Herb. Shuttleworth. Kilbride shore, Herb. Lyon, Brit. Mus. Corriegills, Herb. Glasg. Univ.

P. parasitica Grev. Cumbrae! D. R. Ayrshire, Herb. Brit. Mus. Portincross! Ardrossan! Saltcoats! Herb. Landsb.

P. byssoides Grev. Cumbrae! D. R. Bute, Herb. Shuttleworth. Brodick Bay, Herb. Brit. Mus. et Glasg. Univ.

δ. Polysiphoniæ corticatæ.

P. Brodiæi Grev. Tan Buoy! D. R. Arran, Landsb. Cumbrae, M. Seamills! Herb. Landsb. W. Kilbride, Herb. Glasg. Univ.

**P. thuyoides* Harv. Ayrshire coast, Herb. Brit. Mus. Arran, Landsb. Brit. Seaw. p. 290. Portincross! Herb. Landsb.

**P. fruticulosa* Spreng. Portincross! W. L. in Herb. D. R. Arran, Landsb. Arran! Herb. Landsb. Corriegills, Herb. Glasg. Univ.

Tribe Dasyeæ.

Dasya Ag.

D. arbuscula Ag. Lamlash, M. Cumbrae! D. R.

D. coccinea Ag. Cumbrae! D. R. Common, M.

**D. coccinea* f. *tenuis* J. Ag. Cumbrae! D. R.

Order Ceramiaceæ.

Tribe Spermothamnieæ.

Spondylothamnion Näg.

S. multifidum Näg. = *Wrangelia multifida* Phyc. Brit. Frequent. Cumbrae, M. Ardrossan, Landsb. Brit. Seaw. p. 190. Saltcoats! Herb. Landsb. Brodick Bay, Herb. Glasg. Univ.

Spermothamnion Aresch.

S. Turneri Aresch. = *Callithamnion Turneri* Phyc. Brit. Cumbrae! D. R. Bute, Isle of Inch, Ardrossan, Herb. Brit. Mus. Corry, M. Arran, Landsb. Brodick Bay, Herb. Glasg. Univ.

*S. *Turneri* f. *repens* Le Jol. Bute, Herb. Brit. Mus. Arran, Landsb.

Tribe GRIFFITHSIEÆ.

GRIFFITHSIA Ag.

G. corallina Ag. Cumbrae! D. R. Fintry Bay, M. Lamlash Bay, Arran, Landsb.

G. setacea Ag. Little Cumbrae! D. R. Clyde, Herb. Lyon, Brit. Mus. Loch Ranza, M.

HALURUS Kütz.

H. equisetifolius Kütz. = *Griffithsia equisetifolia* Phyc. Brit. Ayr Heads! D. R. Arran, M.

Tribe MONOSPOREÆ.

MONOSPORA Solier.

M. pedicellata Solier. = *Callithamnion pedicellatum* Phyc. Brit. = *Corynospora* M.'s List. Cumbrae! D. R. Saltcoats, Ardrossan, Herb. Brit. Mus.

Tribe CALLITHAMNIEÆ.

RHODOCHORTON Näg.

R. Rothii Näg. = *Callithamnion Rothii* Phyc. Brit. Cumbrae! D. R. Arran, M. Gourock, Herb. Glasg. Univ.

R. floridulum Näg. = *Callithamnion floridulum* Phyc. Brit. Cumbrae! D. R. Arran, M. Millport, Herb. Glasg. Univ.

*? *R. sparsum* Kjellm. On *Laminaria* stems. Cumbrae, Herb. Glasg. Univ., sub. "*Call. Rothii* or *Call. mesocarpum*."

CALLITHAMNION Lyngb.

a. EUCALLITHAMNION.

*? *C. scopulorum* Ag. Portincross, Greville in Herb. Glasg. Univ. Probably only a form of the following.

C. polyspermum Ag. Skelmorlie! D. R. Largs Pier! D. R. Helensburgh Quay! D. R. Ardrossan, Herb. Lyon, Brit. Mus. Fintry Bay, M. Arran, Landsb. Gourock, Herb. Glasg. Univ.

*? *C. interruptum* Ag. Arran. In Dr. Landsborough's "Arran," p. 283, mention is made of this species in the following words:—"Among some Algæ I sent to Dr. Harvey, Trinity College, Dublin, he was not a little pleased to find what he thought was the long-lost *Callithamnion interruptum*." The species is included without comment in his List of Arran Algæ, but is not mentioned by Mahoney.

C. roseum Harv. Cumbrae! D. R. Ardrossan, Herb. Lyon. Arran, Landsb.

C. affine Harv. Although the specimen on which Harvey founded his *C. affine* was sent to him from the shores of Bute by Dr. Greville, no mention is made of this species in Mahoney's List. I am not aware that any well-authenticated specimen of this species has been met with since its first discovery.

β. PHLEBOTHAMNION.

C. Hookeri Ag. Cumbrae! M. Arran, Landsb. There are several specimens labelled "*C. Hookeri*" in Mrs. Robertson's her-

barium, but all of them appear to me to belong to *C. polyspermum*, and not to *C. Hookeri*. Saltcoats! Herb. Landsb. Portincross, Corriegills, Herb. Glasg. Univ.

**C. Brodiæi* Harv. Arran, Landsb. Not in Mahoney's List.

**C. arbuscula* Lyngb. Arran, Landsb. Not in Mahoney's List. In Mrs. Robertson's Herbarium there are some specimens of this species from Loch Ryan, just beyond the limits of the Firth of Clyde.

C. tetragonum Ag. Cumbrae! D. R. Arran, Landsb. Brit. Seaw. p. 180.

**C. tetragonum* f. *brachiata* J. Ag. Macrehanish Bay! Herb. Landsb.

γ. Pœcilothamnion.

C. corymbosum Lyngb. Girvan! D. R. Cumbrae! D. R. Largs, M. Arran, Landsb. Saltcoats! Herb. Landsb. Gourock, Herb. Glasg. Univ.

**C. granulatum* Ag. Ardrossan, Herb. Cutler. Saltcoats, Herb. Brit. Mus. Cumbrae, R. H. in Herb. Glasg. Univ.

C. byssoides J. Ag. Lamlash, Arran! D. R.

*Seirospora Harv.

S. Griffithsiana Harv. Arran, Landsb. Brit. Seaw. p. 187. Not mentioned by Mahoney.

Tribe Compsothamnieæ.

Compsothamnion Schmitz.

**C. gracillimum* Schmitz. = *Callithamnion gracillimum* Phyc. Brit. Dredged in Lamlash Bay, Arran, Landsborough, "Arran," p. 190.

Tribe Ptiloteæ.

Plumaria Schmitz.

P. elegans Schmitz. = *Ptilota sericea* Phyc. Brit. Cumbrae! D. R. Kildonan! T. King. Saltcoats and Ardrossan, Herb. Brit. Mus. Corriegills, Herb. Glasg. Univ.

Ptilota Ag.

P. plumosa Ag. Cumbrae! Campbletown! D. R. Kildonan! T. King. Saltcoats, Stevenston, Ardrossan, Gourock, Herb. Brit. Mus. Portincross, Herb. Glasg. Univ.

Tribe Crouanieæ.

Antithamnion Näg.

A. plumula Thur. = *Callithamnion plumula* Phyc. Brit. Cumbrae! D. R.

**A. floccosum* Kleen = *Callithamnion floccosum* Phyc. Brit. Saltcoats. Recorded in Herb. Brit. Mus.

N.B.—In Mrs. Robertson's Herbarium there is an interesting specimen of an *Antithamnion*, from Cumbrae, which comes very near to *A. boreale* Kjellm. The ultimate ramuli are much longer and more slender, and the cells of the main axis are considerably longer than in typical *A. plumula*. There are also several well-developed specimens of *Spyridia filamentosa* Harv., a species which may be expected to occur in the Firth of Clyde, from Loch Ryan.

Tribe Ceramieæ.

Ceramium Lyngb.

α. INERMES.

C. tenuissimum J. Ag. = *C. nodosum* Phyc. Brit. Cumbrae! D. R. "Common," M. Brodick Bay, Herb. Glasg. Univ.

C. Deslongchampsii Chauv. Cumbrae! D. R. Ardrossan, Herb. Brit. Mus. Brodick, M. Saltcoats! Herb. Landsb.

C. strictum Harv. Cumbrae! D. R. Lamlash, M.

C. diaphanum* Roth. Cumbrae! D. R. Ardrossan, Herb. Brit. Mus. Arran, Landsb. Portincross, Ardrossan, Herb. Glasg. Univ. **Not mentioned by Mahoney!

C. circinatum J. Ag. = *C. decurrens* Phyc. Brit. Cumbrae! D. R. Arran, Grev. in Herb. Brit. Mus. Corriegills, Herb. Glasg. Univ.

C. rubrum Ag. Cumbrae! Tan Buoy! D. R. Innellan! T. King. Gourock and Kilbride shore, Herb. Lyon in Brit. Mus. Saltcoats, Herb. Glasg. Univ.

**C. rubrum* f. *decurrens* J. Ag. Ardrossan, Corriegills, Kilcreggan, Herb. Glasg. Univ. Dunoon! T. King. This variety comes very near *C. circinatum*, but differs from it in having the lower portion of the filaments completely corticated, while above there is a narrow hyaline space in the middle of each internode, and in having small immersed tetraspores.

C. rubrum f. *prolifera* J. Ag. = *C. botryocarpum* Phyc. Brit. "Common," M. Saltcoats! Herb. Landsb. Corriegills, Gourock, Dunoon, Brodick, Cumbrae, Kirn, Herb. Glasg. Uuiv.

β. Armatæ.

C. echionotum J. Ag. Cumbrae! D. R. Saltcoats! Herb. Landsb.

C. acanthonotum Carm. Cumbrae! D. R. Gourock, Portincross, Herb. Glasg. Univ.

C. ciliatum Ducluz. Arran, Landsb. "Common," M. Saltcoats! Herb. Landsb.

C. flabelligerum J. Ag. Cumbrae! D. R. Ailsa, M. Portincross, Herb. Glasg. Univ.

Cohort Cryptoneminæ.

Order Glœosiphoniaceæ.

Glœosiphonia Carm.

G. capillaris Carm. Cumbrae! J. L. in Herb. Robertson. Saltcoats! D. L.; Herb. Lyon in Brit. Mus. Arran, Landsb. Ardrossan, Herb. Glasg. Univ.

Order Grateloupiaceæ.

Halymenia Ag.

H. ligulata Ag. Cumbrae! D. R. Girvan, M. Arran, Landsb. Brit. Seaw. p. 228.

Order Dumontiaceæ.

Dumontia Lamx.

D. filiformis Grev. Cumbrae! D. R. Innellan! T. King. Ardrossan, Herb. Brit. Mus. Arran, Landsb. Corriegills, Kirn, Herb. Glasg. Univ.

**D. filiformis* f. *crispata* J. Ag. Saltcoats! Herb. Landsb.

DUDRESNAYA Bonnem.

D. coccinea Bonnem. Cumbrae! D. R. "Common," (?) M. Saltcoats! Herb. Landsb.

DILSEA Stackh.

D. edulis Stackh. = *Iridæa edulis* Phyc. Brit. Cumbrae! D. R. Kildonan! T. King. Arran, Landsb. Common, M. Corriegills, Herb. Glasg. Univ.

Order NEMASTOMACEÆ.

Tribe HALARACHNIEÆ.

FURCELLARIA Lamx.

F. fastigiata Lamx. Kildonan! T. King. Common, M.

Order RHIZOPHYLLIDACEÆ.

POLYIDES Ag.

P. rotundus Grev. Kildonan! T. King. Ardrossan and Stevenston, Herb. Brit. Mus. Arran, Landsb. Lady Isle, M. Saltcoats, Landsb. Brit. Seaw. p. 219.

Order SQUAMARIACEÆ.

PETROCELIS J. Ag.

**P. cruenta* J. Ag. Gourock! D. R.

P. Hennedyi Batt. = *Actinococcus Hennedyi* Harv. Cumbrae! R. Hennedy, 1852; D. R., 1854.

CRUORIA Fries.

C. pellita Lyngb. = *C. adhærens* Crn. et *C. Arnotii* Harv. Kilcraggan, near Gourock, Arnott (Harv.in Nat. Hist. Rev. iv. p. 202). Cumbrae! D. R. et Herb. Brit. Mus. Wemyss Bay, Herb. Glasg. Univ.

PEYSSONNELIA Dene.

P. Dubyi Crouan. Cumbrae, Landsb., "Arran," p. 330.

Order HILDENBRANDTIACEÆ.

HILDENBRANDTIA Nardo.

H. prototypus Nardo. f. *rosea* Kütz. = *H. rubra* Phyc. Brit. Fintry Bay, M. Cumbrae, Ardrossan, Corriegills, Kirn, Herb. Glasg. Univ.

Order CORALLINACEÆ.

MELOBESIA Lamx.

M. membranacea Lamx. Common, M. Cumbrae! D. R. Largs, Herb. Glasg. Univ.

M. verrucata Lamx. Common, M.

M. pustulata Lamx. Common, M. Brodick Bay, Herb. Glasg. Univ.

M. confervoides Holm. & Batt. = *Lithocystis Allmanni* Phyc. Brit. Cumbrae, frequent, M.

LITHOTHAMNION Phil.

L. fasciculatum Aresch. = *Melobesia fasciculata* Phyc. Brit. "Common," (?) M.

L. calcareum Aresch. = *M. calcarea* Phyc. Brit, Innellan. Cumbrae, M.

L. polpmorphum Aresch. = *M. polymorpha* Phyc. Brit. Common, M. Arran, Landsb. Corriegills, Herb. Glasg. Univ.

CORALLINA Lamx.

C. officinalis L. Cumbrae! D. R. Common, M. Wemyss Bay, Portincross, Gourock, Herb. Glasg. Univ.

**C. squamata* Ellis. Portincross, Landsb. in Herb. Glasg. Univ.

C. rubens Ellis et Sol. = *Jania rubens* Phyc. Brit. Ayr Heads! Loch Ranza! Girvan! D. R.

SHORT NOTES.

ORCHIS USTULATA IN BUCKS.—This plant is not set down for the county of Bucks in Watson's *Top. Bot.*, 2nd Edit. I lately found it on Coombe Hill, near Drayton Beauchamp. *Herminium Monorchis* was tolerably abundant at the same spot.—E. G. ELLIMAN.

RUBUS LEUCOSTACHYS Schleich. OR R. VESTITUS W. & N. ?—On p. 131 of last year's volume, Dr. Focke discards the former (and older) name as being incongruous. In my opinion it is not so, having been given owing to the markedly white colour of the flowering branches when in *bud*, and not from the hue of the petals. The resemblance to an ear of corn ceases after the blossoms have expanded.—EDWARD S. MARSHALL.

LATHYRUS HIRSUTUS IN S. DEVON.—My daughter, Miss Katharine Emily Waterfield, has found *Lathyrus hirsutus* growing on the sea-face of the railway embankment at Starcross. The patch of the plant is some two square yards in extent. The place is close to Dawlish Warren, a locality so well known that it seems improbable that the plant would have been hitherto overlooked, if it were a native of the district; but its occurrence seems worth placing on record.—WILLIAM WATERFIELD.

ARMERIA PUBIGERA *β.* SCOTICA.—Do Scottish botanists recognise this form? It is described by Boissier in DC. *Prod.* xii. 678, and localised "in insulâ Staffa Scotiæ ubi *Seapink* dicitur legit cl. A. DC.!" I find no reference to it in British books. Like many of Boissier's species of *Armeria* it is no doubt referable to *A. maritima*, but the name may be worth noting.—JAMES BRITTEN.

NOTICES OF BOOKS.

Nouvelle Flore des Champignons. Par J. CONSTANTIN et L. DUFOUR. 8vo, pp. xxxviii, 255; 3842 figs. Paris: Dupont. 5fr. 50c.

IT is scarcely possible to give a true idea of the remarkable ingenuity displayed in the construction of this book. The mere statement that within 255 pages there occur 3842 figures of Fungi, that these pages are a small octavo and that there is abundant

letterpress—pages of it without figures—is sufficient to blast one's character for veracity without some further explanation. The book is an illustrated mycological flora written on the plan of a clavis; the characters chosen are fairly described and sufficient, and to these characters there is added a reduced figure which in most cases is wonderfully good and serviceable. The descriptions are helped by the use of certain symbols, and the result is a highly ingenious guide to the larger Fungi. There is a clavis of the families, another of the genera, and then the tableaux and clavis of the species. Of course the figures are to be understood as characteristic of the species within the generic limits—I mean that the same figure might be repeated for species in different genera; they are serviceable only when the genus has been surely ascertained. It could hardly be otherwise, and the method is quite legitimate. There are ample explanations of the method of using the clavis, a glossary, index, directions for collecting, &c. The Basidiomycetes are all dealt with, species by species; and the Ascomycetes are treated by the selection of prominent genera. No better pocket-book for the collector exists, and it deserves a high measure of success. I strongly advise its constant use by all who have no means of access to the dear illustrated books on the subject. G. M.

ARTICLES IN JOURNALS.

Annales Sci. Naturelles (July). — C. Sauvageau, 'Les feuilles de quelques Monocotylédones aquatiques.'—A. Prunet, 'Sur les nœuds et les entre-nœuds de la tige des Dicotylédones' (4 plates). — P. v. Tieghem, 'Sur la structure et les affinités des Mélastomacées.'

Annals of Botany (June [July]).—'Record of Current Literature for 1890.'

Botanical Gazette (June 15).—A. F. Foerste, 'Abnormal phyllotactic conditions as shown by leaves or flowers of certain plants' (1 plate).—T. Holm, 'Some anatomical characters of N. American Gramineæ' (*Uniola*: 1 plate). — D. White, 'Organisation of fossil plants of the Coal-measures.' — T. Meehan, 'Relation between insects and forms of flowers.'—C. MacMillan, 'Terminology of the spermophytic flower.' — J. M. Coulter, *Coursetia axillaris*, sp. n.—(July 20). J. D. Smith, 'Undescribed plants from Guatemala' (3 plates). — R. Thaxter, 'N. American Hyphomycetes' (2 plates). C. R. Barnes, 'N. American Mosses.'

Bot. Centralblatt. (No. 26).—P. Schumann, 'Zur Kenntniss der Grenzen der Variation im anatomischen Bau derselben Pflanzenart.' —(Nos. 27–32). C. Schmidt, 'Ueber den Blattban einiger xerophilen Liliifloren.'—(No. 32). T. Loesener, 'Ueber die Benennung zweier nordameribanischer Ilices.' — (No. 33). R. Keller, 'Die wilden Rosen der Leventina.'

Bot. Zeitung (June 19–Aug. 21). — C. Wehmer, 'Entstehung und physiologische Bedeutung der Oxalsäure im Stoffwechsel

einiger Pilze.' — (July 24–Aug. 21). L. Jost, 'Ueber Dickenwachsthum und Jahresringbildung.'

Bull. Soc. Bot. France (xxxviii.: Comptes rendus, 4: Aug. 1).— A. Chatin, 'Dates de quelques vieux herbiers.' — H. Leveillé, 'Les Palmiers à branches dans l'Inde.'—A. Battandier, 'Quelques *Silene* d'Algérie' (*S. Pomeli*, sp. n.). — J. Daveau, 'Observations sur quelques *Carex*.' — D. Clos, 'Variété et anomalie.' — J. Foucard, *Muscari Metelayi*, sp. n. (1 plate).—L. Mangin, 'Sur la désarticulation des conidies chez les Péronosporées.' — H. Hua, 'Sur un *Cyclamen* double.'

Bull. Soc. Linn. Paris (No. 119).—H. Baillon, 'Les Sapotacées de la Nouvelle Calédonie.' — Id., 'Sur l'organisation florale du *Greyia*.'—Id., 'Sur les Ternstroemiacées.'—F. Heim, 'Le réceptacle de la Pulsatille.'—(No. 120). H. Baillon, 'Sur quelques nouveaux types du Congo.'—F. Heim, 'Dipterocarpées nouvelles de Bornéo.' — Id., 'Sur le genre *Pierrea*.' — (No. 121). L. Durand, 'Sur l'organogénie du *Poa annua*.' — H. Baillon, 'Plantes de Madagascar' (*Croton*).

Bull. Torrey Bot. Club (July).—J. S. Chamberlain, 'Comparative Study of Compositæ' (2 plates). — T. Meehan, 'Evolution of parasitic plants.' — B. D. Halsted, '*Drosera filiformis* heliotropic.' — C. MacMillan, 'Fungi affecting leaves of Saracennia.'

Gardeners' Chronicle (July 4). — '*Acer Volxemi*' (figs. 1, 2).— (July 11). *Adu Lehmanni* Rolfe, sp. n. — (July 25). *Cypripedium insigne* var. *exul* Ridley, var. n.—(Aug. 8). M. T. Masters, '*Myosotis* Victoria' (figs. 19–21). — *Odontoglossum Hennesii* Rolfe, sp. n.— *Podocarpus nubigena* (fig. 23).

Journal de Botanique (July 1).—C. Sauvageau, 'Sur la tige des Cymodocées.' — Drake del Castillo, 'Contributions à la flore du Tonkin' (*Ormosia Balansæ*, *Bauhinia baviensis*, *B. pyrrhocladon*, spp. nn.). — —. Hue, 'Lichens de Canisy.' — (July 16). P. A. Genty, 'Contributions à la Monographie des Pinguiculacées européennes' (*Pinguicula Reuteri*, sp. n.: 1 plate). — (Aug. 1). E. Bescherelle, 'Selectio novorum muscorum.' — (Aug. 16). P. v. Tieghem, 'Sur la structure primaire et les affinités des Pins.'— P. Hariot & G. Poirault, *Cæoma Moroti*, sp. n.—M. Gomont, 'Faut-il dire *Oscillatoria* ou *Oscillaria ?*'

Journ. Linn. Soc. London (xxviii. 194: Aug. 15). — G. Rodde, 'On the Vertical Range of Alpine Plants in the Caucasus.' — J. H. Lace & W. B. Hemsley, 'Vegetation of British Baluchistan' (*Leptaleum hamatum*, *Gypsophila lignosa*, *Colutea armata*, *Cratægus Wattiana*, *Rubia infundibularis*, *Tanacetum macropodum*, *Saussurea rupestris*, *Primula Lacei*, *Arnebia inconspicua*, *Scutellaria petiolata*, spp. nn.: 4 plates & map). — T. Kirk, 'Visit to Lord Auckland and other Antarctic Islands.'

Journ. Royal Microscopical Soc. (Aug.). — C. H. Gill, 'On the Structure of certain Diatom-valves as shown by sections of charged specimens' (1 plate).

La Notarisia (June 30).—A. Borzi, 'Dei metodi di coltura delle

Cloroficee terrestri.' — E. de Wildeman, 'C. W. von Nägeli' (1817–1891).—Id., 'Sur les crampons des conjugées.'—M. Möbius, 'Conspectus algarum endophytarum.'

Nuovo Giorn. Bot. Italiano (July). — J. Mueller, 'Lichenes Brisbanenses.'— E. Baroni, 'Contribuzione alla lichenografia della Toscana.'—Id., 'Sulla struttura della sene dell' *Euonymus japonicus*.' E. Tanfani, 'Morfologia ed istologia del frutto e del seme delle Apiacee' (4 plates).—Id., 'Sull' origine delle Zucche.'— C. Massalongo, 'Acarocecidii nella flora Veronese' (1 plate).—Id., *Taphrina epiphylla & Viola pratensis* in Italia. — G. Arcangeli, 'Sulla polvere cristallina e sulle druse d'ossalata calcico.' — Id., 'Sull' *Arisarum proboscideum*.'— —. Terraciano, 'Contribuzione alla flora Romana.' —E. Pirotta, '*Urocystis primulicola* in Italia.' — Id., 'Monstruosità nell' *Ionopsidium acaule*.' — C. Grilli, Muscinee ed Licheni marchigiani. — R. F. Solla, 'Altricenni sulla vegetazione nei dintorni di Follonica.'—U. Martelli, 'Per la conservazione del *Cyperus Papyrus* a Siracusa.'—Id., 'Le Anacardiacee italiano.'

Oesterr. Bot. Zeitschrift (July). — E. v. Halácsy, 'Beitrage zur Flora der Balkanhalbinsel' (*Achillea argyrophylla*, *Centaurea Gheorgheffii*, *Hieracium Baldaccii*, *Allium thracinum*, spp. nn.).—L. Celakovsky, 'Ueber die Verwandtschaft von *Typha* und *Sparganium*.' — F. Arnold, 'Lichenologische Fragmente' (1 plate). — E. Woloszczak, 'Salices novæ vel minus cognitæ.' — C. Baenitz, '*Vaccinium uliginosum*.' — (Aug.). R. R. v. Wettstein, 'Ueber die Section *Laburnum* der Gattung *Cytisus*.' — E. Junger, 'Botanische Gelegenheitsbemerkungen.'

Trans. Bot. Soc. Edinburgh (xviii.). — J. E. T. Aitchison, 'Products of Western Afghanistan.' — Id., 'Hints on Material for Botanical Expedition.' — G. F. Scott Elliot, 'Regional distribution of Cape Flora.' — A. Bennett, '*Arenaria gothica* in Britain.' — Id., 'Record of Scottish Plants, 1890.' — F. B. White, 'Willows in University Herbarium.'—Id., 'History of *Agropyrum Donianum*.'— Id., '*Poa palustris* as British.' — G. W. Traill, 'Marine Algæ of Dunbar Coast and Orkneys.'—P. Sewell, 'Germination and growth of species of *Salvia*.' — Id., 'Flora of the Alpes Maritimes.' — G. Mann, 'Comparative Study of Chlorophyll.' — Id., 'Observations on *Spirogyra*.' — Id., 'Method of preparing tissues for paraffin imbedding.' — T. Berwick, 'Glands in Cotyledons and mineral secretions of *Galium Aparine*.'—J. T. Johnson, 'Additions to Flora of Moffat.' — D. Christison, 'Difficulty of ascertaining age of trees in Uruguay from number of rings.' — C. E. Hall, 'Tree-measurements made in Uruguay.'—R. Lindsay, '*Nepenthes*.'

BOOK-NOTES, NEWS, &c.

In accordance with the suggestion made by several correspondents, we have reprinted in pamphlet form the Rev. H. G. Jameson's useful *Key to British Mosses*, with the accompanying

plate. Copies may be obtained from the publisher of this Journal for 1s. 6d., post-free. The *Hand-list* of the Algæ of the Clyde Sea Area has also been reprinted for the Committee for the Exploration of the Marine Flora of Western Scotland, and may be obtained from Mr. George Murray, Natural History Museum.

The recently issued number of the *Proceedings of the Linnean Society* contains, among other matter, the Presidential Addresses delivered by Mr. Carruthers in 1889 and 1890. The first is devoted to a careful and exhaustive history of the various existing portraits of Linnæus, and is followed by a catalogue of the large and valuable collection of portraits of Fellows and others, belonging to the Society. The second address is on "The early history of some of the species of plants now constituting a portion of the Flora of England." A summary of the conclusions arrived at by the author will be found in this Journal for 1890, p. 223, and space will not allow us to notice them further. But we would suggest to Mr. Carruthers the desirability of rendering this and other kindred papers* available to the general public by reissuing them in an accessible and easily obtainable form. This is desirable, not only on account of the intrinsic merits of the papers themselves, but because they would serve in some measure as antidotes to the licence of imagination emancipated from the trammels of fact which is now so largely accepted as "science."

The *Contributions from the U. S. National Herbarium*, issued by the U. S. Department of Agriculture, continue to appear with admirable frequency. The part issued on June 30th contains a list of the plants collected by Dr. E. Palmer in 1890 in Western Mexico and Arizona, by Mr. J. N, Rose; many new species are described, and eleven of the most interesting are figured. The Department has also issued the first part, containing the *Polypetalæ*, of a Manual of Western Texas plants, by Prof. J. M. Coulter. "The work has been prepared not only as a convenient reference-book for botanists, but also as a hand-book for Texan students, and the latter purpose explains the introduction of analytical keys, local names and uses, and simplicity of description, which would not have been necessary for the professional botanist," who, however, we venture to think, is also likely to be thankful for simple descriptions. We are inclined to regret the entire absence of references to previous works, and should like to see adopted in our English-written books the continental practice of giving at any rate an indication of the place of first publication after the name of each species. The absence of this leaves us in doubt, for example, whether *Abutilon Nealleyi* Coulter is here first published, especially as the indication "n. sp." does not follow the description of *Thelypodium Vaseyi*, which is certainly new. The *Manual* is certain to be useful: and we cannot commend too highly the practice of the Department in adding an index to each part of their *Contributions*.

---

*e.g., the Address to the Biological Section of the British Association in 1886 (see Journ. Bot. 1886, 309).

"La Guerre des Nymphes suivie de la Nouvelle Incarnation de Buda" is the title of a pamphlet in which Dr. Saint-Lager discusses the nomenclature of *Nymphæa*, and the vexed question of *Buda* v. *Tissa*. Those who have read the author's former lucubrations on nomenclature will not expect to find here any practical solution of difficulties, and will therefore not be disappointed.

The most recent part of the *Flora Brasiliensis* contains a portion of Dr. K. Schumann's monograph of the *Malvaceæ*. A new genus, *Modiolastrum*, is established, to which *Modiola malvifolia* Gr. and a previously unpublished species are referred.

We regret to announce the death of Cardinal Haynald, which took place at Kalocsa, Hungary, on the 4th of July. The memoir by Prof. Kanitz, to which we referred at p. 128, gives a full account of the life of the amiable and distinguished prelate; we regret that the present demands upon our space preclude us from giving an abridgment of this.

The organisation of a Botanical Survey of India, which has been under consideration since 1885, has been finally settled; the details are published in *Nature* for August 13th. It will be under the general control of Dr. King, who is officially entitled "Director of the Botanical Survey of India."

An account of the Herbarium and botanical collections in the Science and Art Museum, Dublin, prepared by Prof. Johnson, has lately been issued at the Museum. The Irish Flora is represented by Miss Ball's collection of Algæ, Dr. D. Moore's Mosses and Hepatics, and Mr. T. Chandlee's Flowering Plants: there is also a collection of "Kildare plants (by Douglas) presented by Marquis of Kildare." The general herbarium contains, among others, the collections of Prof. W. R. McNab and Dr. Litton, and the Lichens and Fungi of Admiral Jones. The greater part of the collections at the Royal Botanic Gardens, Glasnevin (see Journ. Bot. 1883, 55), have been transferred to the Museum.

We are glad to learn that the second edition of Mr. Mansel-Pleydell's *Flora of Dorset* is passing through the press.

Under the title 'Monomialism,' Prof. L. H. Bailey, in the *Botanical Gazette* for July, states his objections to the "new fashion of naming plants" which is adopted by some (mostly American) botanists, and on which we have more than once animadverted. Should space permit, we shall reproduce Prof. Bailey's vigorous and well-timed protest in these pages. The same number of the *Gazette* contains a very trenchant review of Dr. Aveling's recent *Introduction to the Study of Botany*.

The second part of Miss Florence Woolward's Monograph of *The Genus Masdevallia* has just been issued, and is a worthy successor of the first, of which we spoke at some length at p. 88 of this volume. This second instalment contains figures and descriptions of the following species:—*M. civilis*, *M. corniculata*, *M. cucullata*, *M. infracta*, *M. leontoglossa*, *M. maculata*, *M. picturata*, *M. Reichenbachiana*, *M. Schlimii*, *M. tovarensis*. This handsome monograph should form part of the library of every orchid-grower.

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British Museum Natural History), South Kensington.

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OF
BRITISH MOSSES.

BY THE REV. H. G. JAMESON, M.A.

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Potamogeton undulatus *Wolfg. var.* Cooperi.

ON A NEW BRITISH *POTAMOGETON* OF THE *NITENS* GROUP.

By Alfred Fryer.

(Plate 313.)

Potamogeton undulatus Wolfg., v. Cooperi mihi = *P. crispus* × *P. perfoliatus*.—Rootstock with terete stolons, rather shallow rooting. *Stem compressed*, stout, somewhat spirally twisted between the internodes, obscurely quadrangular, deeply guttered on the broad flattened sides, rounded and sometimes obscurely winged on the edges; simple below, ultimately much branched above, with short branchlets springing from the axils of the stem-leaves, which in their growth produce axillary stolons terminated by winter-buds, or by ordinary young branches. Leaves bright green, undulate, all similar, *semiamplexicaul*, oblong-ovate, or narrowly elongated and longitudinally folded, *blunt*, *cymbiform*, often slightly hooded in young growths, ascending or reflexed, edges apparently entire, but finely serrulate with very minute persistent spines, 7-ribbed, with 3 prominent and 4 faint intermediate ribs connected by obscure transverse veins. Stipules scarious, truncate, soon decaying on the main stems, subpersistent on the branchlets, with the lowest subherbaceous, and bearing a small adnate leaf; alternate, or rarely opposite. Peduncles slender, not thickened above, curved, and somewhat quadrangular and twisted; spikes short, few-flowered, with abortive drupelets; whole plant submerged, 2–10 ft. long, growing throughout the winter like *P. crispus*.

P. undulatus is intermediate in habit and specific characters between *P. crispus* and *P. perfoliatus*; generally with the facies of the latter species, it approaches *crispus* in its early states, and the flowering branches often present a striking resemblance to those of *P. nitens*, to which species, in an aggregate sense, I consider it belongs. Following the method I adopted in a previous note on *P. crassifolius*, I rank this probable hybrid, with *perfoliatus* as one parent, as a member of the *nitens* group, having a specific value equal to that of such forms as *P. decipiens* Nolte and *P. salicifolius* of the *London Catalogue*, ed. 8.

From *P. perfoliatus* the present form is sufficiently distinguished in a fresh state by its *compressed stems*, and when dried (in which process the stem-characters of both species are lost) by its *semi-amplexicaul leaves*, embracing only half the stem, whilst those of *P. perfoliatus* are joined to it by two-thirds of their base, and are deeply cordate, so as to completely surround it. From *P. crispus* the cymbiform, apparently entire, leaves separate *P. Cooperi* in its mature state at a glance; but in a young state leaves are sometimes produced on the upper part of the stem which closely resemble those of young winter-growths of *P. crispus*. These leaves, however, are more finely serrulate, and are usually less flattened.

P. nitens v. *obovatifolius* Tiselius approaches *P. Cooperi* very nearly, but may be distinguished in a dried state by its peduncle,

which is slightly thickened above like that of typical *P. nitens*, and by its non-serrulate flattened leaves.

P. Cooperi was first discovered by Mr. E. F. Cooper, of Leicester, in the canal at Loughborough. On looking over the series of *P. perfoliatus* in his herbarium, I was much struck by the resemblance of some specimens to Dr. Tiselius' v. *obovatifolius*, and also to a *Potamogeton* from the River Dee, near Chester, then recently sent to me by Mr. C. R. Billups. Fresh specimens confirmed my view as to the close relationship of the two British plants, and subsequent cultivation for two seasons proved their absolute specific identity.

P. undulatus Wolfg. was described in Roem. et Schult. Syst. Mant. ed. 3, 1827, iii. 360, where it is placed as a variety, or subspecies of *P. crispus;* but Wolfgang had previously distributed it as a "species," a rank I had assigned to the variety *Cooperi* before I examined Wolfgang's type in Nolte's herbarium at the British Museum. Although the typical specimen differs from the English form of the plant in some slight degree, I at once saw that it is specifically identical with *P. Cooperi*, and is, with little doubt, a hybrid between *P. crispus* and *P. perfoliatus*, an opinion strongly confirmed by Wolfgang's specific description, which I here append:—

"n. 21 a. *Potamogeton undulatus* Wolfg.; caule compresso, sulco utrinque longitudinali, fluctuante, inferne ramoso; foliis omnibus submersis, membranaceis, integerrimis, alternis, oblongo-ovatis, lanceolatis, rotundato-obtusis, apice planis, amplexicaulibus; stipulis truncatis, complanatis, cauli adpressis. Wolfg. MS. n. 22. Besser in litt.

"Differt a *P. crispo* foliis longioribus, majoribus, integerrimis (nec crispatis, nec serrulatis), colore atroviridi et venis non convergentibus, sed transversim reticulato-striatis. *Wolfg.* In specim. nostro flores desunt; folia 4–5 poll $\frac{1}{2}$–$\frac{1}{3}$ poll. lata, majora quam in *crispo*, quidquam undulata, 5–7 nervia, nervis 3 fortioribus. Maxime sane affinis *P. crispo*. In fluvio Waha prope Wilnam. *Wolfg.*" R. et S. *l. c.*

The only important respect in which the above description differs from that given of *P. Cooperi* is that the leaves are described as non-serrulate. The minutely-toothed edges of the leaves escaped the notice of the describer, but they are present in Wolfgang's specimen in Nolte's herbarium, and exactly resemble those of the British plant.

Here, too, we must place *P. perfoliatus* var. *Jacksoni* F. A. Lees, a form well described by that acute botanist in *The Botanical Record Club Report* for 1880, p. 150:—"Leaves all submerged, alternate and half-clasping, yet they are not recurved in the way Scottish *nitens* at any rate are; nor are the upper stipules large and persistent. The young plant has alternate, willow-like, plane-edged, 5–7-veined, pellucid leaves, closely resembling the *serratus* var. of *P. crispus*. I propose the name *Jacksoni* for it as a variety of *P. perfoliatus*."

On carefully examining the type-specimen sent to the Record Club (now in Herb. Brit. Mus.), I found Mr. Jackson's plant to

have the minutely serrulate leaf-edges of *P. undulatus*, and to be specifically identical with that form; as a variety of *undulatus*, it differs from *P. Cooperi* in its nearer approach to *P. perfoliatus*, in its less-recurved leaves, and in its less *nitens*-like facies generally. On the other hand, *P. undulatus* v. *Cooperi* has strongly and regularly recurved leaves in many of its states, the leaves are more undulate, and the whole plant more nearly approaches both *P. nitens* and *P. crispus* in facies.

Here, then, we again meet with a group of closely similar forms, which, although slightly, and probably constantly, differing from one another, constitute a very natural "species" of equal rank with such aggregates as *P. nitens* and *P. decipiens*. The three species again form a natural larger group, the members of which seem to have had one common descent from *P. perfoliatus* on one side or other.

Placed in natural sequence, according to their degrees of resemblance to the type first described by Wolfgang, the *undulatus* forms will stand as—

P. UNDULATUS Wolfg.
var. a. *Cooperi*.
var. b. *Jacksoni*.

The typical *P. undulatus* has been variously referred by good botanists to *P. crispus*, *P. perfoliatus*, and *P. prælongus*; var. *Jacksoni* to *P. perfoliatus*, *P. nitens*, and more doubtfully to *P. prælongus*; and var. *Cooperi* to *P. crispus* and *P. perfoliatus*.

Prof. Babington's opinion on var. *Jacksoni* is so valuable that I cannot refrain from quoting it:—"I am not clear about this; can it be *P. nitens?* or is it a state of *P. prælongus?* I think the former" (*Record Club Report*, 1880, p. 150). Here the Professor shows that grasp of this difficult genus which has made the descriptions of *Potamogeton* in his *Manual of British Botany* the clearest and most accurate we yet possess.

In *English Botany*, ix. 43, under the description of *P. perfoliatus*, Dr. Boswell Syme notices a plant which may possibly belong to the present species:—"In deep water, as in the Kyle of Sutherland, the Lossie, and other places, a form occurs with the leaves much narrower than usual, less amplexicaul, darker in colour, and turning black and dim in drying." This form should be examined in a fresh state, to see whether it has a compressed stem. Also all forms of *perfoliatus* with semiamplexicaul narrowly elongate leaves should be carefully compared with typical examples of the species; if the faint intermediate ribs do not exceed four on the whole leaf, then the plant may probably be *P. Cooperi*.

My thanks are due to Mr. E. F. Cooper and to Mr. C. R. Billups for an abundance of fresh specimens, and for notes on the habit of *P. Cooperi* in its native localities; and also to Mr. R. Morgan for the great pains he has taken to draw the accompanying plate, which exactly represents a series of fresh specimens gathered by Mr. Cooper in the Loughborough Canal. No space could be afforded to figure the earlier states of the plant, which often so little resemble the figures here given as to look like a distinct

species. I mention this that no charges of inaccuracy may be brought against the artist, who has really produced one of the most perfect representations of a *Potamogeton* I have yet seen.

EXPLANATION OF PLATE 313. — Fig. 1. Upper part of barren stem. 2. Flowering stem. 3. Lateral branchlets. 4. Part of stem with recurved leaves. 5. Perianth-segment. 6. Detached lower stipule with adnate leaf. 7. Section of peduncle. 8. Section of main stem.

PRIMARY CHARACTERS IN THE SPECIES OF *RHEUM*.

BY FREDERIC N. WILLIAMS, F.L.S.

IN proposing a re-arrangement of the species of any genus with a view of improving upon a previous classification, three things have to be considered:—(1) Whether the primary characters selected for the subdivision of the genus were sufficiently important; (2) to what extent the study of individual species and the discovery of new ones have modified the relative importance of certain organs, and in a subordinate manner have enlarged or contracted the scope of the genus; (3) which is more ethical than botanical, how far the egotistical pretensions of a writer may prompt him to entertain 'views' diametrically opposed to what has been previously written upon the same subject.

In any re-arrangement of species, it is desirable to have regard for the more divergent characters of the generic type which are emphasized in well differentiated species, and which themselves indicate subdivisions in which groups of species should be placed. As long as there are botanists who handle a genus as if it were an "objective reality," instead of treating it as an "abstract definition" invented for grouping an uncertain number of naturally allied species, so long will be misinterpreted the famous sentence of Linnæus, that "it is not the characters which make the genus, but the genus which makes the characters." As new forms are discovered, and as the relative importance of the individual characters of those already known is better understood, so will the definition of a genus have to be modified to include the new forms and circumscribe their deviations from the type, or another one be invented for the convenience of associating divergent forms which have certain primary characters in common. A genus is a matter of convenience: a species is a matter of fact.

The fourteenth volume of DeCandolle's *Prodromus*, which contains Meisner's description of the genus *Rheum*, was issued in the year 1856. Since then several new species have been described, and many that were at that time but little known have been more fully investigated. The continued research for the purpose of determining the true source of the rhubarb used in medicine has been the main cause of the more recent investigations as to the affinities of the different species.

According to Flückiger and Hanbury,* the districts of the Chinese Empire which produce rhubarb extend over a vast area. "They are comprised in the four northern provinces of China Proper, known as Chihli, Shansi, Shensi, and Honan; the immense north-western province of Kansuh, formerly partly included in Shensi, but now extending across the desert of Gobi and to the frontiers of Tibet; the province of Tsing-hai, inhabited by Mongols, which includes the great salt-lake of Koko-nor and the districts of Tangut, Sifan, and Turfan; and lastly, the mountains of the western province of Szechuen." It has been reserved for Col. Prjewalsky, the Russian explorer, to prove almost beyond the possibility of doubt, by inquiries conducted on the spot in 1873, and again in 1880, that the true source of the finest Chinese rhubarb is a plant very similar to, if not identical with, *R. palmatum*,† and found by him in the district of Tangut. The late M. C. J. de Maximowicz, in a letter to Prof. D. Oliver, dated 4th Aug. 1889, states that the rhubarb cultivated for the drug in Western Kansuh is certainly *R. palmatum*. The roots last sent by Col. Prjewalsky to St. Petersburg "were distributed to chemists and medical men there to be tested, and were found to agree with the old Moscow rhubarb in quantity of effective matter and action on the stomach." Plants were also raised from seed, and yielded at first a drug of fair quality, but the roots soon deteriorated in the unfavorable climate of the Russian capital. Linnæus at first thought that the source of officinal rhubarb was *R. undulatum*;‡ after reading Prosper Alpinus' dissertation, he thought it might be *R. Rhaponticum*,§ and subsequently referred it to *R. palmatum*.

It may be as well now to notice some of the generic characters in so far as they may indicate those on which the subdivisions of the genus might be based. Meisner, in his grouping of the species, selected two characters as a basis of classification—the branching of the inflorescence, and the contour of the leaves. I am afraid that neither of these can be depended upon as primary characters, though they may be useful in distinguishing species in groups of a lower grade.

The Leaves.—The ocreæ which sheath the thick stem, as well as those which sheath the base of the petioles, are dry and scarious. The petiole is very variable in character, and may be terete, semi-cylindrical, bilaterally compressed, or polygonal, and may be smooth

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* *Pharmacographia*, p. 446.

† The citation usually given for this plant is "*Linn.* Fasc. 7," which is not only misleading, but meaningless. Expanded properly, this citation should stand "*Linn. fil.* Pl. rar. hort. Upsal. fasc. i. p. 7." Linnæus' son was certainly the first to describe the plant fully, but it is briefly referred to on p. 531 of the second edition of the *Sp. Plantarum* (1762).

‡ In *Sp. Plantarum*, ed. 1, p. 371, this plant is described as *R. Rhabarbarum*; in the second edition, however, the name was altered to *R. undulatum*, and this latter name is subscribed in Linnæus' handwriting in his own copy of *Amænitat. Acad.* vol. iii. (1759), on the third page of Samuel Ziervogel's thesis, "De Rhabarbaro."

§ *De Rhapontico*, Leyden, 1718 (written probably about 1610).

or furrowed on either surface, or both. The lamina of the leaf is large and spreading, and either entire, undulato-crenate or sinuato-dentate, rarely divided into laciniated lobes (only in *R. palmatum**). The number of nerves are usually 3–7, but vary from nine in typical specimens of *R. rhizostachyum* to a single prominent midrib in *R. uninerve* and *R. pumilum*, two species described by Maximowicz in 1880.

The Flowers.—Meisner divides the genus into three sections. The characters which he gives as diagnostic of the third section which includes three species) are—"Racemi spiciformes, indivisi. Folia indivisa. Pedicelli fasciculati, infra medium articulati." A few remarks on these characters will partly illustrate the object of this paper. As to the first character, the only apparent difference between "racemi paniculati" and "racemi spiciformes, indivisi" is the degree of transition between the primary and subsidiary branching of the inflorescence. A common mode of branching is such as can be seen in *R. undulatum*. From the forks of the lowest and second leaves there are rarely any flowers. Taking an upper leaf, from the base of the petiole spring three peduncles, of which the central is much longer and more vigorous than either of the lateral ones; each of these peduncles branches secondarily in like manner in different directions, the two lateral racemes remaining very small. In the secondary ramifications the lateral racemes frequently diverge at a slightly different level. Each of these terminating racemes produces alternate fascicles of flowers along the rhachis. As to the second character, it is noted in the previous paragraph that all the species have "folia indivisa," except *R. palmatum*. Throughout the genus it is certainly unusual for the pedicels to be otherwise than "infra medium articulati." In garden specimens I have frequently noticed variation in the articulation of the pedicels, but never in herbarium specimens or in authentic drawings of species under natural conditions. The three species included in the section might conveniently be fused: *R. spiciforme* and *R. Moorcroftianum* are scarcely to be distinguished, even "on paper."

Calyx.—The floral envelope is simple, with traces of a differentiation into two whorls. By Linnæus it is called a corolla, by Bentham and Hooker a perianth, and by Meisner a calyx. The last term is to be preferred. "Perianthium," a Linnean term, has been objected to, because it etymologically denotes something round the flower, but it seems not inappropriate for the envelopes which surround the essential part of the flower. "Perigonium," a later term, has the advantage of meaning something round the reproductive organs, which is precisely what it is. The incipient differentiation into two whorls is seen in all the species which have

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* Also in *R. officinale*, if this plant can be considered otherwise than of the same species. There are, however, ample reasons for suspecting that the seeds sent up by the French missionaries to Paris in 1867, from which the type-plants were raised, were obtained from specimens in a state of semi-cultivation; and indeed Dr. Baillon admits that he has not seen any wild specimens.

nine stamens; in these the three outer segments are rather smaller and comparatively narrower than the three inner ones. In *R. nobile*, which has six stamens, the segments of the calyx are equal, similar, and almost free, so that in this species the floral envelope and the androecium are in a sense *homotaxic*. The calyx dries up after maturation, but remains attached to the base of the fruit.

Stamens.—These consist of an outer whorl of six, and an inner whorl of three; except in the case of *R. nobile*, in which the inner whorl is suppressed, as in *Oxyria* and *Rumex*. The filaments are broadened out at the base, but distinct from one another, except in *R. australe* and *R. Webbianum*, where they are united below, and spring from a common ring of connective tissue. The anthers are introrse.

Fruit.—The fruit is a samaroid achene, by Hayne,* Royle,† and Muenter‡ called a caryopsis, by Bentham and Hooker a nut, and by Meisner an achene. It is scarcely flat enough to be considered a true samara, and the term "nucule" is never applied to the fruit of a unilocular ovary containing a single seed. Linnæus distinctly stated that there was no pericarp; but in most of the species it is of the nature of a thin subcrustaceous covering. The embryo is straight, and slightly excentric; the cotyledons are foliaceous and plane, and the radicle short. In *R. nobile*, the curved cotyledons indicate transition to *Nyctagineæ*.

Taking into consideration the specific affinities, both individual and collective, I propose that the first character upon which the subdivision of the genus should be based be the number and attachment of the stamens. Apart from its anomalous habit, *R. nobile*, in being distinguished from all the other species by having six stamens, seems to require to be separated from them altogether. *R. australe* and *R. Webbianum*,§ which have their stamens united at the base, also require to be placed in a group by themselves. More important than the contour of the leaf is the fibrous framework of its subdivisions, and these two characters from the nutritive organs will suggest groups of a lower grade.

Several species described by Meisner and subsequent writers are merely garden forms of tainted origin, and branded "patria ignota." I do not think that the interpolation of such descriptions should be allowed to obscure the systematic affinities of the species in a synopsis of the genus.

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* *Darstellung der Arzney-Gewächse*, Bd. xii.

† *Illustr. Himal. Bot.* t. 78.

‡ *Actes d. Congr. Internat. Bot. Amsterd.* 1877, p. 212.

§ The sheet labelled "*R. Emodi*" among Wallich's East Indian plants in the Linnean Society's library contains specimens of two species mixed up together, and it is impossible to tell which specimen Wallich intended to be the type. Royle, in his examination of the specimens, has pointed out that one of them is the *R. australe* of Don; it is better, therefore, in order to avoid confusion, to adopt his name of *R. Webbianum* for the other.

ON THE SUPPOSED OCCURRENCE OF *EPILOBIUM DURIÆI* J. GAY IN ENGLAND.

By the Rev. E. S. Marshall, M.A., F.L.S.*

As readers of this Journal may be aware, I have paid much attention to the British Willow-herbs during the past four seasons, and have published the results of my observations in its pages from time to time. Hearing that Mr. Clarke proposed to record a Hampshire plant found by him as *E. Duriæi*, a species not, in my opinion, likely to occur in this country, I asked him to send me a specimen. He not only did so, but also, on a subsequent visit to Kew, most courteously showed me a large series of the plant in question, besides indicating the herbarium-material upon which his conclusion rests. I only venture to differ from him on the ground that I have studied our home representatives of this very difficult genus with much care, and under exceptionally advantageous conditions. Although my inspection of the Kew bundles was necessarily brief, and I have not had an opportunity of examining seeds under a microscope, yet the notes then made are, I believe, trustworthy as far as they go.

On receiving the plant under consideration, I at once recognised in it a state of *E. montanum*, with which I have been familiar since 1888, and which, under cultivation, at once returned to good average type. It grows plentifully in several localities near me, and I have seen it in more than one Scotch county. This is the "*forma minor aprica*" of Haussknecht's monograph. He has himself seen a specimen, and fully endorses my naming, also remarking that "*E. Duriæi* is an altogether different plant,"

Gay's species is, undoubtedly, a near ally of *E. montanum*; which is also true of *E. lanceolatum*, *E. collinum*, and *E. hypericifolium*, all of them, in my judgment, good and distinct species. But I do not think that Mr. Clarke is warranted in combining the two, against the opinion of both the leading continental authorities and of continental botanists generally, without having examined the living plant of the Vosges and Pyrenees. It is one thing to know book-characters, and quite another to know the plants described; and this holds good, in a less degree, of opinions based on *dried* specimens, very often carelessly selected and indifferently preserved. An example taken from Bentham's *British Flora* may serve as an illustration:—"Specimens [of *E. roseum*] in which the stigma is slightly lobed have been distinguished under the name of *E. lanceolatum*." Those who know the plants will appreciate this remark, which is hardly surpassed in grotesqueness even by the same author's degradation of *Carex depauperata* to a variety of *C. distans* (!).

Surely Mr. Clarke has made a slip in speaking of "the remarkably persistent kataphylloid leaves from the preceding year"

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* See *Journ. Bot.* 1891, p. 225.

as covering the base of the stems. All our species die down to the ground, and the new flowering-stems are produced from stolons or rosettes which have outlived the winter. The withered leaves which he notices are those of the *same* year, and their occurrence is not limited to this form of *E. montanum*; for it is usual in analogous states of *E. Lamyi* and *E. obscurum* which I have found in its company. This peculiarity disappeared in my garden; and the presence of such a feature in an *accidental state* of one species does not destroy its value as a *constant character*, in another species.

Mr. Clarke and myself are thus fully agreed on one point, namely, in considering that his Hants form belongs to *E. montanum*, and may be traced into the type by insensible gradations. Our difference amounts to this:—He asserts "that *E. Duriæi* J. Gay, is an English plant"; I say, with great respect, but without a shadow of doubt, that it has not yet been found in Britain.

Mr. N. E. Brown is well known as an able and accurate draughtsman, and I have no fault to find with the figures given; but I must say that the shabby little specimen of *E. Duriæi* here depicted does not give an adequate notion of the species, as represented in the Kew set. Still, the lower half of the plant is quite unlike any example of *E. montanum* that I have yet come across. M. Barbey's fine plate, on the contrary, hits off the average *E. Duriæi* remarkably well. Is not Mr. Clarke mistaken in stating that it was drawn from Gay's righthand type-specimen? If so, it is a great improvement on the original. There is a beautiful sheet from the Jura, collected in 1869 by L. Favrat and W. Barbey, and I should suppose a specimen of this gathering to have been copied.

To avoid further tediousness, I pass on to the best book-characters by which to differentiate *E. montanum* (including the f. *minor aprica*) from *E. Duriæi*; remarking, however, that British —to say nothing of foreign—willow-herbs cannot be mastered without patient and systematic study of their various forms, in the field as well as in print and in herbaria.

1. In *E. Duriæi* (as in *E. collinum*) the buds are obtuse; in *E. montanum* they are always apiculate or mucronate.

2. The capsules of *E. Duriæi* are much stouter, and the flowers larger, in proportion, than in normal *montanum*; they are also described as being "saturate violacei," instead of rose-coloured, pink or white.

3. The stem is always simple in *E. Duriæi*; in *E. montanum* it is frequently branched.

4. In *E. Duriæi* the general cut of the leaves recalls *E. lanceolatum* rather than *E. montanum*, and their texture seems to be different ("molles et minces"); the lower ones are gradually narrowed into a rather long petiole, whereas in *E. montanum* they are sessile or shortly petioled, with a broad, rounded base.

5. The stolons of *E. Duriæi* are "entièrement semblables aux stolons de l'*E. alsinefolium*." This, to my thinking by far the most important distinctive character, is exceedingly well illustrated by Barbey, and can be fairly well seen in several of the Kew

examples. But the above remark certainly does not apply to any of the *montanum* states represented in tab. 307, which well illustrate the root-variations of that species. I quite agree with Mr. Clarke in putting J. S. Mill's small specimen to *E. Duriæi*; but that very accurate observer, who must have known *E. montanum* well, collected and ticketed the plant as *E. alsinefolium* Vill.

Speaking generally, the *facies* of the two plants in question is, to me, very distinct; added to which there is the further argument that, while *E. montanum* is lowland and subalpine, not reaching 2000 feet in Scotland, to the best of my belief *E. Duriæi* is decidedly alpine, its altitudes, as given on the labels at Kew, varying from 1280 to 1500 mètres.

Before concluding, I beg leave to take exception to Mr. Clarke's tone in speaking of Haussknecht's book. I have found it, as far as European species are concerned, most accurate and helpful, much more so, indeed, than the average monograph. On the extra-European plants it is obviously and confessedly less valuable, owing to the frequent scarcity or bad quality of the materials, and the want of personal acquaintance with certain forms when living. In particular, it is not quite just to mention "his varieties" without explanation; for he expressly says (Preface, p. vi):—"I have hitherto met with no such thing as a constant variety," and, consequently, all modifications are merely ranked as "forms." I have satisfied myself by repeated experiments that this is a correct proceeding, as far as our native species are concerned; some of them vary so much that certain states could easily be taken (and, indeed, have been taken) for separate species, but they are not constant from year to year, even in their natural stations.

Nor is the question of hybridity one to be dismissed off-hand, as though it could be safely ignored. British botanists have, until recently, been far too much under the spell of Smith's and Fries' *ipse dixit*. The latter's maxim (*Mant.* ii. p. 57),"Non omnia, quæ ipsi non vidimus, in dubium vocemus," was usually ignored by himself, when a hybrid origin for any plant was suggested; and much of his work, notably on *Salices* and *Epilobia*, was quite vitiated, owing to this prejudice. I myself have no particular natural bias either way; but I can affirm that any one with a fairly quick eye will soon be able to settle the question for himself, as regards this particular genus, beyond all reasonable doubt. It is the herbarium-botanists who make difficulties. I cannot see why it should be inconceivable for insects to do unconsciously what all are agreed that florists do consciously and more clumsily. I have only to mention the names of Archer Briggs, Beeby, Linton, Purchas, Rogers, and Towndrow, in order to show that my opinion is shared by very sober-minded and cautious workers. To those who still object, I can only answer, "E pur si muove."

NOTES ON SOME S.W. SURREY *RUBI*.

By Rev. W. Moyle Rogers, F.L.S., and Rev. E. F. Linton, M.A.

These notes are the fruit of two short visits paid by each of us to Witley, near Godalming, in 1889 and 1890. Staying with the Rev. E. S. Marshall, we had the advantage of his guidance to the best *Rubi* localities in his neighbourhood; and we are much indebted to him for unstinted assistance in every way, as also to Prof. Babington and Dr. Focke for their kind help in the determination of the more difficult species. The district is remarkably rich in *Rubi* forms, and much yet remains to be done with them, as our few short expeditions, all confined to the immediate neighbourhood of Witley, necessarily left a good deal of ground unexplored, even within that limited area. In fact, of the plants met with, two or three will have to stand over for further study. The few records from the neighbouring district of Woking we owe to the Rev. R. P. Murray. An asterisk will be found prefixed to those species which we suppose to be, so far, unrecorded for the county.

Rubus Idæus L. Common, and plainly native.

R. suberectus Anders. Charles Hill, Tilford.

R. plicatus W. & N. Witley, heaths and road-sides; locally abundant. "The common plant of North Germany. Very characteristic," Dr. Focke. Besides this typical plant, there is a very luxuriant form by the road-side between Brook and Grayswood, which in some respects approaches *R. sulcatus* Vest., especially in the elongated large-flowered panicles.

**R. hemistemon* P. J. Müll. Royal Common, Elstead, and near Charles Hill, Tilford. Named by Dr. Focke, and considered by him "a remarkable variety of *plicatus*." A very handsome plant, hardly differing from luxuriant *plicatus*, except in the leaves, which are more constantly quinate and of a yellowish green and hairy above, and densely softly hairy and greyish beneath, with long oval and very gradually acuminate leaflets, coarsely and irregularly dentate. Though the styles are usually longer than the stamens, they are not invariably so, even on the same panicle.

**R. nitidus* W. & N. Mare Hill, Witley, and Royal Common, Elstead. "The typical plant," Dr. Focke. Luxuriant much-branched bushes with small bright pink petals, numerous strongly-hooked prickles on panicle, and equally numerous but usually patent and unequal prickles on barren stem. A very marked plant, differing considerably from the form of *nitidus* common in S. Hants and E. Dorset (which Dr. Focke thinks is probably the *R. integribasis* P. J. Müll.), and still more from another form, which is so common about Witley as to be one of the characteristic brambles of the neighbourhood. This last has large flowers, crowded at first, but ultimately lengthened into a branching leafy panicle, which (as in *R. integribasis*) is but slightly armed with falcate or declining prickles. Its leaves (unlike those of the typical plant) are of a dull opaque green.

R. affinis W. & N. Mare Hill, where it was discovered by the Rev. R. P. Murray. Almost if not quite identical with the plant about Bournemouth which has been accepted as typical *affinis* by Dr. Focke.

R. rhamnifolius W. & N. Frequent. The ordinary British form. Between Witley and Hambleton Mr. Marshall found a large bush, or clump of bushes, of a very handsome bramble, which seemed certainly of hybrid origin—*leucostachys* × *rhamnifolius*.

R. nemoralis P. J. Müll. Aggregate. Common. Probably the form *R. Münteri* Marss., or very near it.

R. carpinifolius W. & N. Witley, near the ponds, and on a common near. Also near Woking (R. P. Murray).

**R. rhombifolius* Weihe. Near the ponds, Witley; Royal Common, Elstead; common between Witley and Hambledon. Abundant. This and the last have been confirmed by Dr. Focke.

R. Lindleianus Lees. Witley, rather frequent. Thursley.

R. rusticanus Merc. Common.

**R. pyramidalis* Kalt. Cramhurst Lane, Witley; only in moderate quantity, but fairly typical. Among the pines on Mare Hill occurs in plenty a slightly different form, very robust, and having the panicle almost destitute of setæ.

**R. Colemanni* Blox. Common between Witley and Hambledon, in good quantity. Named by Dr. Focke, Prof. Babington assenting. The convexity of the leaves and the very strong broad-based prickles are striking features of this plant.

R. leucostachys Sm. Common.

**R. macrophyllus* W. & N. Witley. Milford. Munstead. Apparently rather scarce and variable.

R. Sprengelii Weihe. Mare Hill, in great quantity. Near Woking, abundant (R. P. Murray).

**R. rubicolor* Blox. MS. (*R. erubescens* Wirtg.). Discovered near Woking by Mr. Murray, and named by Dr. Focke.

**R. infestus* W. & N. Cramhurst Lane, in fair quantity. Name confirmed by Dr. Focke. A slender and rather weak form.

**R. scaber* W. & N. Park Lane, Witley; in one place, in a crowded hedge. Named by Dr. Focke "*R. scaber* Wh. et N., forma *angustifolia*," and especially referred to by him as "very characteristic."

**R. debilis* Boul.? Road-side near Charles Hill, Tilford, in considerable quantity. Named by Prof. Babington. A very strongly armed and luxuriant bramble, to which the name *debilis* (likely soon, Prof. Babington says, to give place to another) seems singularly inappropriate. Mr. Marshall has found a hedge-row plant near Elstead Mill, which he believes identical with this.

R. echinatus Lindl. Common and typical.

R. Radula Weihe. Not conspicuously common. Besides the typical plant, there occurs in several places a more strongly armed form approaching *R. echinatus* Lindl. and *R. Anglosaxonicus* Gelert.

**R. mutabilis* Genev. Barnacle Hill Common, and by the ponds, Witley. Near Charles Hill, Tilford (E. S. Marshall). An exceedingly handsome plant, which seems to come nearer to the Plymouth

form (var. *nemorosus* Genev.) than any other yet found in Britain. Name confirmed by Prof. Babington. Near this, but apparently distinct from it, and having affinities with *R. adscitus* Genev. and *R. Lejeunei* W. & N., is a plant which occurs in considerable quantity on Wareham Hill and Barnacle Hill Common.

R. rosaceus W. & N. and b. *Hystrix* Weihe. The latter seems one of the commonest brambles of this part of Surrey; but it is very variable, and often approaches typical *rosaceus*.

**R. Koehleri* W. & N. Fairly typical plants occur in Cramhurst Lane and elsewhere in the district; but the prevailing form, which seems widely distributed, is a very distinct-looking plant, with long branching panicle, remarkably unequal prickles, and singularly small deeply-toothed leaves. Dr. Focke and Prof. Babington agree with us in placing this under *Koehleri*, but they do not seem to have met with anything quite like it. Mr. Murray has found it near Woking, and Mr. J. W. White at Ewhurst, about twelve miles east of Witley.

**R. flexuosus* M. & L. In several places in Witley parish; typical and abundant.

**R. viridis* Kalt. Witley; very abundant locally, and especially in the woods by the ponds. Also at Busbridge. Named by Dr. Focke. On Barnacle Hill Common and other exposed places it becomes very robust, and might occasionally be rather easily confounded with some of the stronger *Hystrix* and *rosaceus* forms. In E. F. Linton's herbarium there is a specimen of this open ground form (labelled "*rosaceus*"), gathered by Mr. Mennell at Chelsham, Surrey.

**R. hirtus* W. & N. Under this apparently must go some plants at Munstead, and perhaps elsewhere in the neighbourhood.

R. diversifolius Lindl. Common.

R. Balfourianus Blox. Witley, occasionally; and near Charles Hill, Tilford. Quite typical in two or three spots. By stream between Woking and Worplesdon (R. P. Murray).

R. corylifolius Sm. Common, and chiefly typical *sublustris*.

R. cæsius L. Seen only at Elstead. In woods at Munstead occurs, apparently in considerable quantity, a remarkable plant, which Dr. Focke considers to be a hybrid between *cæsius* and *Koehleri*, or some allied form.

THE UNFOLDING OF WOOD-SORREL LEAVES.*

By Agnes Fry.

Every one who knows anything about a wood in spring time, knows well the bright clusters of light green leaves which almost hide the delicate flower of the wood-sorrel; and everyone who has

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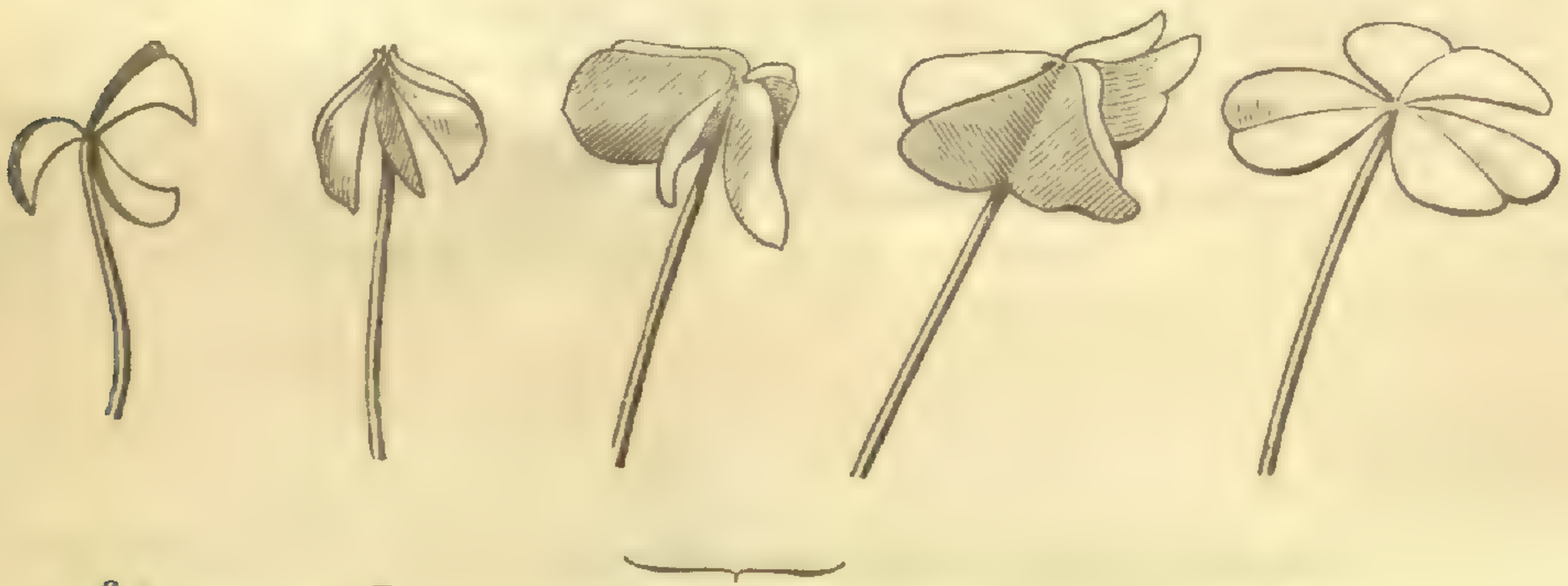
* [We are indebted to the Editor of *Nature Notes* for permission to reproduce Miss Fry's paper from that Journal for Aug. 15th, and for the loan of the accompanying figures.—Ed. Journ. Bot.]

noticed them at all will remember their shape—a trefoil with little notches in the middle of each division. The mature leaf is flat, the leaflets being set at right angles to the stalk. But how did the leaf grow like this? or did it grow out of the ground in exactly this form and shape? This latter alternative would be well-nigh an impossibility, for then the leaf would offer a large plane of resistance to the overlying soil. As a matter of fact, it offers the smallest point possible—only the top of the bent stalk, as shown in fig. 1, where the leaf is hardly to be recognised at all



1 2 3 4 4A 5 6

In the next stage the leaf is beginning to open, and here the three leaflets may be distinguished. They are (as in fig. 2) all folded down their midribs, and lying side by side, the middle one projecting slightly beyond the others. In fig. 3 the leaflets have moved apart, the side ones moving sideways, and the middle one up and back; at the same time they open slightly, as shown in fig. 4. In figs. 5 and 6 further positions may be traced; the middle leaflet, having gradually raised itself to an upright position, is now turning over, and the side leaflets have moved downwards and backwards, until, as in fig. 7, they all hang unfolded round the stalk. After this the leaflets move upwards, at the same time unfolding completely, until they form the flat, three-divisioned leaf which we set out from.



6A 7 8 9

In this way the middle leaflet not only revolves through about three-fourths of a circle, but afterwards reverses its motion, until it is about at right angles to the stalk; and during all this complicated motion the movement of growth is being also carried on.

It is not very easy to explain the unfolding of these leaves on paper, but it is very easy to trace it in nature, and in early spring the leaves may be found in almost all stages, growing close to each

other. Whether anyone who had not seen the mature leaf could guess what these tiny folded leaflets would develop to I do not know, but I certainly think that anyone who had to devise how a flat trefoil leaf could be best stowed away, would be much puzzled to do it as daintily as has been done by the thousands and thousands of tiny green sorrel leaves which have sprung up over our island this spring.

All the illustrations (except 4A, which is a front view) show the same side of the leaf, and the successive positions of each may be traced.

THE GENUS *CORION* OF MITCHELL.

By N. L. Britton, M.D.

Unless I am very much mistaken, the genus *Corion*, published by Mitchell in *Act. Phys. Med. Acad. Nat. Cur.* viii. App. 218 (1748), is the same as *Tissa* Adans. (1763), *Buda* Adans. (1763), *Lepigonum* Fries (1818), and *Spergularia* Presl (1819). Under the title "Nova genera plantarum Virginiensium," Mitchell characterises his genus as follows:—

"IV. Corion.

Cal.—*Perianthium* pentaphyllum, foliolis quinque lanceolatis, expansis, persistens.

Cor.—*Petala* quinque, oblonga, obtusa, expansa, calice majora, marcescentia.

Stam.—*Filamenta* octo & duodecium, tenuissima inæqualia, caduca; *Antheræ* rotundæ.

Pist.—*Germen* ovatum: *styli* tres erecto-patuli; *stigmati* crassiuscula.

Per.—*Capsula* longa conica, trigona, unilocularis, trivalvis.

Sem.—Plura, rotunda, libera.

Si liceat, ex partium fructificationis numero & capsulæ forma, Alsinastrum, Alsinellam & alias ab Alsine vera separare, certe & hæc eadem lege ab Arenaria Linn. separanda est; præsertim quum facie gaudeat propria; veritatem forte dies docebit."

The characters of *Spergularia* Pers. are given as follows by Bentham and Hooker (*Gen. Pl.* i. 152):—"Sepala 5. Petala 5, integra, rarius abortu pauciora vel 0. Stamina 10 v. abortu pauciora. Ovarium 1-loculare, ∞-ovulatum; styli 3. Capsula 3-valvis. Semina reniformia-globosa v. a latera compressa, alata v. nuda."

It will be seen that these two descriptions are substantially the same, Mitchell's being somewhat more detailed.

NOTES ON THE FLORA OF CORK, KERRY, AND DUBLIN.

By G. Claridge Druce, M.A., F.L.S.

The following notes were made after paying a hurried visit to Ireland in the last week of June, 1890. An asterisk prefixed to a record means that the writer believes the plant to which it is attached is newly recorded to the county. The elevation to which the plant ascends is appended in many cases. Carn Tual, the highest mountain of Ireland, was ascended by way of the Hag's Glen, on a beautiful day, so that a view of a very magnificent character was enjoyed. The small number of alpines noticed on the mountain was very remarkable to one fresh from the Scotch hills. The descent was made on the southern side into the Black Valley, and from thence homewards through the Gap of Dunloe. Another day was spent in the Horse's Glen, on the north side of Mangerton; this again yielded few alpine flowers, but the scenery was very grand, and the day delightfully fine.

Anemone Nemorosa L. Ascends to 1500 ft. on Carn Tual. This needs a capital. It was used in a generic sense by Ruppius in the *Flora Jenensis*.†

Ranunculus acris L. Cod. 4084 = *R. Boræanus* Jord. Between Glengariff and Kenmare, Kerry.

Fumaria Borœi Jord. Killarney, 1*. New to the south of Ireland. — *F. densiflora* DC. Portmarnock, 5*. An addition to the Irish Flora. It was growing with *F. officinalis* in a corn-field, and was also met with at Holyhead, across the Channel.

Barbarea arcuata Reichb. I was delighted to meet with typical specimens, exactly agreeing with Reichenbach's plant, near the Railway Hotel, Killarney, and also by the rail-side near the station, 1*. This has only been on record from Armagh, in the north of Ireland. The English specimens labelled *B. arcuata* which I have seen I should refer to the divaricate state or variety of *B. vulgaris*. Dr. Baker's specimens from Warwickshire, in my possession, are certainly only *B. vulgaris*.

Raphanus maritimus Sm. Portmarnock, 5.

Reseda lutea L. Kenmare, 1*.

Polygala serpyllacea Weihe. Occurs on Carn Tual at 2800 ft.— *P. vulgaris* L. Some magnificent specimens occurred on low limestone rocks on the north side of Kenmare Bay. In many respects they are very near the var. *grandiflora* Bab., but the leaves in these specimens are not so coriaceous, nor have they such revolute margins as the Ben Bulben plants. In the vicinity occurred

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† [We are unable to agree with Mr. Druce in this opinion. Linnæus took his specific name, not from *Nemorosa* of Ruppius, which he does not cite, but from Bauhin's *Anemone nemorosa flore majore* (Pinax, 176, 1623), which Ruppius also quotes as a synonym of his *Nemorosa flore roseo, albo, expanso* (Fl. Jen. 146, 1718). The established spelling of names should never be disturbed except in cases where this is absolutely necessary, and this is not one of them. — Ed. Journ. Bot.]

another form, which does not agree with *P. vulgaris*, *P. serpyllacea*, or *P. oxyptera*, although perhaps rather nearer the latter plant. As far as description goes, it is very near to *P. aquitanica* Clavaud. The lamented death of the author of the *Flore de la Gironde* prevents me from obtaining his opinion as to the identity of the Irish plant with his from Western France.

Stellaria uliginosa Murray. Reaches 2800 ft. on Carn Tual.

Cerastium vulgatum L. (*C. triviale* Link). At Glengariff a peculiar form, with very narrow leaves clothed with rather stiff hairs, was gathered on a wall-top. — *C. semidecandrum* L., var. *viscosum* Koch. Portmarnock, 5.

Sagina apetala Harduini. Kenmare, more glabrous than usual.

Spergula sativa Boenn. Kenmare, 1*. Portmarnock, 5*.—*S. arvensis* L. (*S. vulgaris* Boenn.). Portmarnock, 5.

Oxalis Acetosella L. Grew at 2800 ft. on Carn Tual.

Vicia sepium L. Occurred at 1200 ft. in the Horse's Glen, Kerry.

Alchemilla vulgaris L. At 2400 ft. on Carn Tual.

Potentilla Anserina L., var. *viridis* Koch. Cork.

Rubus macrophyllus Weihe et Nees. Glengariff and Kenmare (*teste* Dr. Focke).—*R. Hystrix* Weihe. Glengariff, 1. At Glengariff I gathered a bramble which Dr. Focke writes me is an undescribed form, at least not known from the British Isles. Br. Briggs once sent him a form near it from Plymouth, and Dr. Focke has cultivated it under the name of *R. devoniensis*; but there is a remarkable difference, he says, between the Irish and the Devon plant, that is, in the relative length of styles and stamens. In the Irish plant the stamens are very long; in the Devon they are much shorter than the styles.

Rosa involuta Sm. Glengariff, 1*.—*R. villosa* L. Glengariff, 1*. New to the south of Ireland.—*R. rubiginosa* L. Near Glengariff, 1.

Epilobium montanum L., f. *minor*. Muckross, 1. — *E. parviflorum* × *obscurum*. Glengariff, 1*.—*E. obscurum* × *palustre*. Glengariff, 1*.—*E. obscurum* Schreb., f. *aprica* Haussk. Glengariff.

Sedum album L. On Glengariff Bridge.—*S. quinquefida* Haworth (*S. sponhemica* Gmel.). In the Hag's Glen, near the lake (*teste* J. G. Baker).

Valeriana sambucifolia Mik. Kenmare, Glengariff, 1*.

Drosera obovata Mert. et Koch. Near Glengariff, rare, 1.

Galium verum L., var. *litorale* Bréb. Portmarnock, 5.

S. aquaticus Hudson. At 1000 ft. on Carn Tual.

Centaurea nigra L. At 1500 ft. in Glen Curraghmore.

Cnicus arvensis Hoffm., var. *horridus* Koch. Kenmare, 1.—Var. *mitis* Koch. Glengariff, 1.

Hypochæris radicata L. Ascends to 2000 ft. on Carn Tual.

Hieracium iricum Fries. On Turner's Mountain, Kerry side, 1. Fine specimens.

Microcala filiforme Link. et Hoffmansegg in Fl. Port. ii. 1242 (1820) = *Hippion filiforme* Schmidt in Roem. Arch. (1805). Was in good condition by Bantry Bay, 1.

Pedicularis silvatica L. At 3000 ft. on Carn Tual. This has

rather larger flowers than our English plant. With white flowers on Mangerton.

Rhinanthus Crista-Gallii L., var. *angustifolia* Gren. et Godr. Near Glengariff, Cork. Mr. A. G. More also showed me specimens of the same form in his herbarium; it may not be uncommon in Ireland.

Melampyrum pratense L. About Glengariff, Kenmare, and Killarney. The yellow-flowered form, which I described in the *Yorkshire Naturalist* for Sept. 1884, pp. 85, 86, from plants gathered in Wigtonshire, which I have since found in Invernesshire, Nairn, &c. The leaves in the Irish plant are much broader, and the plant is rather shorter than the Scotch specimens. Indeed, many of the Irish specimens approach the var. *latifolium* in this respect.

Veronica officinalis L. 2400 ft. on Carn Tual.

Pinguicula grandiflora Lam. 2800 ft. on Carn Tual. In the Horse's Glen an intermediate form occurred, but it was rather nearer *vulgaris* than *grandiflora*.

Primula vulgaris Huds. 2800 ft. on Carn Tual, and at 1600 ft. on Mangerton.

Lysimachia nemorum L. 2800 ft. on Carn Tual.

Callitriche platycarya Kuetz. 1300 ft. in Glen Curraghmore, 1. —*C. intermedia* Hoffm. (1791) = *C. hamulata* Kuetz. Kenmare, 1.

Juniperus nana Willd. At 1800 ft. on Carn Tual.

Iris Pseudacorus L., var. *acoriformis* Bor. Only form seen in 1.

Juncus biformis L., var. *fasciculatus* Koch. Glengariff. — *J. supinus* Moench. Reaches 2400 ft, on Carn Tual. — Var. *uliginosus* Roth. Kenmare, Bantry, 1.

S. erecta Desf., var. *congesta* Lej. Kenmare, 1.—Var. *pallescens* Koch. Kenmare. Glengariff, 1.

Potamogeton polygonifolius Pourr. At 1500 ft. in Glen Curraghmore.

[*H*] *Eleocharis multicaulis* Sm. At 2000 ft. on Carn Tual. — *E. latifolium* Hoppe. Rare; a few plants at the south end of the Gap of Dunloe, 1. A very rare Irish plant.

Carex pulicaris L. 3000 ft. on Carn Tual. — *C. divulsa* Stokes (who described the species before Goodenough). Muckross. — *C. pilulifera* L., var. *longibracteata* Lange. At 2800 ft. on Carn Tual. —*C. extensa* Good. Kenmare. Glengariff, 1. A lax form at Kenmare, with the lower spikelet very remote, with long bracts, is very like the figure 655 in Reichb. Ic. Helv. et Germ., Plate 274, of the var. *Balbisii* (Spr.) Reich. — *C. fulva* Good. At 1800 ft. on Carn Tual.—*C. pallidior* Dégl., which antedates the name of *C. punctata* Gaud. Glengariff. Very fine specimens on north side of Kenmare Bay, growing in crevices of the limestone rock, 1.

Anthoxanthum odoratum L. A lax form on south side of Kenmare Bay, and at Glengariff, 1. Also the var. *pubescens* Gray.

Aira caryophyllea L., var. *aggregata* Timb. Wall-top, Kenmare. Beautiful specimens, 16–18 in. high.

Agrostis alba L., var. *maritima* Meyer. Portmarnock, 5.

Trisetum pratense Pers., var. *variegatum* Gaud. Portmarnock, 5. —**Var.** ***lutescens.*** Glengariff, &c., 1.

Sieglingia decumbens Bernh. A form with long pedicels (2½ times as long as spikelets) occurred on the south side of the Caha Mountains, 1.

Poa annua L., var. *supina* Schrad. 2600 ft. on Carn Tual.

Festuca ovina L., var. *paludosa* Gaud. = *capillata* Hack. Glengariff, 1*. — *F. rubra* L. (type). Kenmare. Also as a condensed form (*teste* Hackel) on rocks near Kenmare.

Bromus erectus Huds., var. *pubescens* Gray. Portmarnock, 5.— *B. hordeaceus* L. Sp. Pl. ed. 1. = *B. mollis* L., Sp. Pl. ed. 2.— Var. *glabrescens* Coss. et Germ. Kenmare, 1.

Agropyron repens Beauv., var. *Leersianum* Gray. Kenmare, with type.

Lastrea Oreopteris Presl. The Horse's Glen. At 1600 ft. on Carn Tual.

SHORT NOTES.

The Nomenclature of Potamogetons. — There are one or two errors in my papers on the above, which later information enables me to correct :—

Journ. Bot. 1890, p. 297. Herr E. Junger kindly writes that *P. intricatus* Nolte equals *P. controversus* Nolte; but I can find no publication of either name.

Ib., p. 300. I said that I believed *P. pumilus* Wolfg. to be P. *Lonchites* of Tuckerman. By the kindness of Dr. J. Lange, I have been enabled to examine an original specimen of Wolfgang's plant, which is *P. Claytonii* Tuckerman. This leaves it to be decided whether this or *P. pensylvanicus* Cham. can claim priority of publication, both having been published in 1827. I have not yet been enabled to decide this, even with Dr. Schumann's kind help.

Ib., p. 302. *P. pusillus* L. v. *interruptus* Schult. Oest. Fl. ed. 2 (1814) is a wrong reference, due to reliance on a quoted opinion (a dangerous practice). It does not occur there, and *P. interruptus* Kit. ap. Schult. Oest. Flora, ed. 2 (1814) is a *pectinatus* form = *P. flabellatus* Bab. *P. interruptus* Presl in herb. Prague! is probably *Friesii*, but I cannot find that Presl published the name. — Arthur Bennett.

New Berks Plants. — Mr. A. W. S. Fisher, a scholar of Winchester College, while visiting at Crowthorn, discovered *Illecebrum verticillatum* L. in that neighbourhood. I visited the locality, and saw two patches of the plant growing not far from the original place of its discovery. I believe it to be native there. It grows in a damp sandy situation on a peaty soil, with *Juncus supinus*, *Drosera intermedia*, *D. rotundifolia*, *Hydrocotyle*, *Peplis Portula*, and seedling *Erica Tetralix*. As it exists in only small quantity, I refrain from giving a more precise locality. It is a most interesting addition to the British Flora. In the neighbourhood of Crowthorn, Mr. W. W. Fisher has gathered *Arnoseris pusilla* Gaert. This is a new record for Berks: it exists in the border county of Hants.—G. C. Druce.

New Bucks Plants. — In the neighbourhood of Chalfont St. Peters the Rev. F. H. Woods gathered last year *Peucedanum palustre* and *Polygonum dumetorum*, which are both new to Bucks. I have seen specimens of each.—G. C. Druce.

Monmouth County Records. — During a brief holiday in July, spent at Monmouth, I obtained the following plants, which, common as they are, have not hitherto been recorded for the county. They were all gathered within the limits of Monmouthshire (*Top. Bot.*, vice-county 35):—*Arenaria serpyllifolia* (*sphærocarpa* Tenore), *Vicia sepium*, *V. tetrasperma*, *Polygala vulgaris* (*eu-vulgaris*, segregate), *Geranium dissectum*, *Conium maculatum*, *Scleranthus annuus* var. *biennis*, *Humulus Lupulus*, *Allium vineale* var. *compactum*. Also *Chara vulgaris* (*vulgaris* proper, *fide* Mr. James Groves), in a small pond in Dixton Newton parish, adjacent to Monmouth town. This is the first *Chara* record for Monmouthshire. *Vicia hirsuta* is named for the county in Mr. F. A. Lees' supplemental 'Summary of Comital Distribution,' issued in connection with the (? defunct) Record Club, but without personal authority. This also I met with on the road-side between Monmouth and Trelleck. — William Whitwell.

NOTICES OF BOOKS.

The Species of Epilobium occurring North of Mexico. By William Trelease. (From the Second Annual Report of the Missouri Botanical Garden.) 8vo, pp. 49, with 48 plates.

The typography and "get-up" of this concise monograph leave nothing to be desired, and it forms a very handy introduction to the willow-herbs of the United States and British North America. Thirty-nine species are recognised, of which *E. holosericeum*, *E. delicatulum*, and *E. clavatum* are described for the first time.

Prof. Trelease has evidently studied the large amount of herbarium material placed at his disposal with great care and ability, and seems to have steered a middle course between the "lumping" and the "splitting" schools. At the same time, to judge from the internal evidence furnished by the letterpress, he has but a limited acquaintance with the living plants, though quite familiar with the literature of the genus. He has therefore been well-advised in not attempting, with one or two exceptions, to deal with hybrids. No amount of herbarium work will ever fit a man to settle the position of such very "critical" things; a good out-door knowledge of the parent species, and the variations to which they are liable, is absolutely indispensable. Thus a great difference is apparent between the publication now before me and the European part of Haussknecht's *Monographie*, almost every page of which betrays the touch of a master who has systematically investigated the subjects he treats of *in the field*, as well as in the study.

The figures are, as a rule, spirited, and give a good general notion of the plants illustrated; those of *E. anagallidifolium*, *E.*

"*alpinum*," *E. Hornemanni*, *E. adenocaulon*, and *E. coloratum* being among the best. They cannot, however, be compared for a moment with Cuisin's beautiful plates in Barbey's *Genus Epilobium*, or with those drawn by Prof. Haussknecht; partly from a certain sketchiness, partly from being on too small a scale, but more often because they are evidently taken from poor specimens, carelessly dried. *E. hirsutum* is hardly recognisable; nor do *E. holosericeum*, *E. leptocarpum* and *E. brevistylum* come off at all well.

I do not feel qualified to dogmatise about non-European species; yet I find it extremely difficult to believe that *E. paniculatum* and *E. jucundum* A. Gray can be forms of one species. The habit, size of flowers, and shape of petals, as shown both in Barbey's and Prof. Trelease's figures, are quite as far apart as in *E. hirsutum* and *E. parviflorum*, which none but a tyro would combine. *E. hirsutum* is said to be "doubtfully established"; but in July, 1881, I found it growing abundantly by a stream near Rogers Rock Hotel, at the head of Lake George, associated with *Impatiens fulva*, and looking so thoroughly wild that I entered it in the Hooker's *Student's Flora* which I had with me as if native.

On the nomenclature adopted, two criticisms seem not uncalled for. The name *E. spicatum* Lam. is substituted for the now almost universally accepted one of *E. angustifolium* L., because Lamarck stated that the latter referred to *E. Dodonæi* Vill. But the plant of *Fl. Lapp.*, *Fl. Suec.*, and *Hort. Cliffort.* is the same as that of *Spec. Plant.*; and, in point of fact, *E. Dodonæi* is not a native of Scandinavia, so the assertion is demonstrably absurd, not to mention that the specimen in Linn. herb. is the plant usually called *angustifolium*. "*E. alpinum* L." is also used to denote the plant published by Haussknecht as *E. lactiflorum*, on the principle of retaining what remains of the old aggregate, after *E. anagallidifolium* and *E. Hornemanni* have been subtracted. For this there is more to be said, inasmuch as it is the *alpinum* of Linn. herb.; but the argument is greatly weakened by the fact of *E. parviflorum* being represented in that collection by *E. Lamyi*, and *E. tetragonum* by *E. roseum*. *E. anagallidifolium* Lam. is the *alpinum* of Scandinavian and of most Continental and British authors, and the adoption of the proposed change would only add to the existing confusion, which I believe can only be got rid of by abandoning the name *alpinum* altogether, as has been done by Haussknecht.

The brief introduction shows great merit, and the definitions throughout maintain a high level of clearness and compactness; one leaf-description, however, "entire or remotely very low denticulate," reads too much like a very literal translation from the German.

As the willow-herbs maintain their specific characters very well in cultivation, it is to be hoped that Prof. Trelease will continue his researches into the American forms, and supplement this unassuming, but important and useful little work by one on a more ambitious scale, in the course of the next few years.

EDWARD S. MARSHALL.

American Nomenclature again.

Flora Franciscana. An attempt to classify and describe the vascular plants of Middle California. By Edward L. Greene. Part I. 8vo, pp. 128. San Francisco: Doxey & Co. March 30, 1891. 75 cents.

Professor Greene, whose activity and energy we have more than once commended in these pages, has undertaken a useful work in preparing a handbook of the flora of "Middle California." It is of course comparing small things with great to suggest any parallel between our own counties and these large tracts of country, much of which is unexplored; but they have this in common, that they tend to concentrate and limit observation, and so secure a more exhaustive and careful study of the plants of particular districts.

The sequence of orders adopted by Prof. Greene is not that to which we are accustomed, but matters of convenience weigh lightly with some of our transatlantic friends. His method of citing the place and date of publication for each species is admirable, and we have often urged the adoption of this practice in our British manuals.

That there are novelties in nomenclature goes without saying. *Tithymaloideæ* (Ventenat, 1799) replaces the familiar *Euphorbiaceæ* (Brown, 1814), and *Drupaceæ*, *Pomaceæ*, and *Rosaceæ* stand as independent orders. When we come to the genera, we find "*Lupinus*, Catullus" (!), "*Euphorbia*, Pliny," "*Amygdalus*, Theophrastus," "*Linum*, Vergil." Certain genera are split up, such as *Spiræa*, which is divided into "*Spiræa*, Tournefort," "*Aruncus*, Linnæus," "*Basilima*, Rafinesque," and "*Schizonotus*, Rafinesque." Would it not have been well to cite place and date of publication for genera as well as for species?

Specific names have been similarly treated. We find many like

"*Trifolium pratense*, Tragus, Stirp. Hist. 586 (1552)."

"*T. repens*, Rivinus, Tetrap. 17 (1690)."

With regard to the latter work, it may be that Prof. Greene has access to an edition not recorded by Pritzel, who gives 1691 as the date of publication, and this is the date of the British Museum copy. In this there is only a casual reference to *Trifolium* at p. 17, and no mention of *T. repens;* there is, however, an excellent plate (unnumbered) duly lettered *T. repens*.

We believe Dr. Britton and other members of the new school do not follow Prof. Greene in his researches into antiquity, and are content to limit their investigations to Linnean and post-Linnean writers. But we note that Prof. Greene is not at one with Dr. Britton either in the position which he took up in these pages three years since,* or in the still later one to which he, so far as we know, still adheres, and to which we shall refer later. Dr. Britton, in 1888, endeavoured to enforce the citation in brackets of the original namer of a species under the genus to which it was subsequently transferred, followed by the name of him who so transferred it: thus, "*Disporum Menziesii* (Don) Britton" would

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* *Journ. Bot.* 1888, 295.

mean that Don had named the plant *Menziesii* under some other genus, and that Dr. Britton had placed it in *Disporum*. This system, Dr. Britton said, "our common sense of justice and right assures us to be the better." But Prof. Greene, who shares with Dr. Britton the honour of having raised this new standard,* seems in the work before us to have modified his views, for he writes "*Alsinella saginoides*, Greene. Linn. Sp. Pl. i. 141 (1753) under *Spergula*": whereas the name, on the principles which he and Dr. Britton were the first to recognise, should stand "*A. saginoides* (Linn.) Greene." Similarly "*A. crassicaulis* Greene. Wats. Proc. Am. Acad. xviii. 191 (1883) under *Sagina*" should be "*A. crassicaulis* (Wats.) Greene." We ourselves quite support Prof. Greene's present way of writing, which is in accordance with the Decandollean principles to which we have adhered from the first; but how does it square with Dr. Britton's pathetic plea that "due credit" may be given "to all concerned"?†

Dr. Britton by implication asserted in 1888‡ that the plan he then advocated was "just, rational, and *stable*." But alas for its stability! He has now§ declared his intention of throwing in his lot with the ornithologists; the "common sense of justice and right" has given way to more recent considerations. "I would write *Magnolia fœtida* (L.)," he says, "not *Magnolia fœtida*, Sargent. [would this ever have been right on Brittonian principles?]; *Hicoria minima* (Marsh), not *Hicoria minima* (Marsh), Britton. In other words, I would quote the original author of the name, and leave the author of the binomial to be brought out in the synonymy of the species, by means of a check-list or other compilation. This has the advantage of doing away with the double citation [the "just, rational, and stable" plan of three years before], and eliminating all personal considerations in the publication of new binomials." The name last cited will therefore stand as "*Alsinella crassicaulis* (Wats.)," so long as Dr. Britton remains in his present mind: three years ago he would have written it "*A. crassicaulis* (Wats.) Greene." We cannot help wondering what Prof. Greene—the Wallace to Dr. Britton's Darwin—will say to this sudden and complete change of front.

We are glad to find that all American botanists are not carried away by these new views. Prof. L. H. Bailey has so admirably stated the rational view of the position,‖ that we think our readers will like to read what he says:—

"I suppose that the object of a name is to afford some ready and tolerably permanent means of designating a particular plant. And we have always been taught that it is no part of any system of nomenclature to give credit to any person. An author's name is attached to any plant for the simple purpose of identifying the plant-name, and we are also taught that the oldest name of any plant must stand. In order to meet these various requirements, botanists have been in the habit—erroneously, it now turns out—

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* *Garden and Forest*, iv. 202.
§ *Garden and Forest*, l. c.
† *Op. cit.* 259.
‡ *Journ. Bot.* 1888, 295.
‖ *Botanical Gazette*, July, 1891, p. 215.

of employing two words to designate the plant, and this has been known as the binomial system of nomenclature. But now they are telling us that these two words do not constitute the name of the plant, but that *the name, per se*, is the second word of the two. In other words, *saccharinum* is the name of the sugar-maple, *Canadensis* is the name of a Cornus,—although one of my botanies declares that it is the name of a rush, and even of a spruce! —and that *repens* is the name of white clover. This is the monomial system of nomenclature, and its devotees are delving through every author in the hope of finding *the name* of the plant. When this name is found,—or supposed to be found, which amounts to the same thing,—it is attached to some generic name to which it was never designed to fit, and the twain, to which an algebraic formula has been attached, is given to the world as the monomio-binomial name of the plant.

"Now there is only one reason why I object to all this, and that is, that it serves no purpose. It adds nothing to the stability of the name, but rather weakens it. In many cases we can hardly hope to find the oldest specific name which chanced to be applied to the plant, and we can seldom be sure that we have found it; while it is a comparatively easy and sure process to find the oldest binomial. I deny the proposition that the specific name is *the name*. It does not designate the plant, and therefore fails to satisfy the first demand of a name. The binomial answers every requirement of the definition of a name, and it has the distinct advantage of dating from a definite point—the work of Linnæus. But if we once begin to attach the oldest specific name to any genus whatever,—as the fashion of the time may determine,—there is no reason why we should stop our search for specific names with the time of Linnæus. In fact, some botanists are even now advising the use of names from the old herbalists, and the system, if logically prosecuted, must eventually include them. I cannot see one point in favour of the new system. It certainly weakens the permanence of nomenclature, for there is less reason to suppose that the mono-binomial is permanent than that the most recent binomial is. After fifty years or so of this upheaval, we would be practically just where we are now, except that we should have added cumbersome formulas to nearly all our names. The new mongrel binomials would be subjected to just the same chances as those we now employ. We would have digged a hole for the extreme satisfaction of filling it up again.

"The straits into which this new system often leads one are ludicrous. But I object to the untruthfulness of it, in many cases. *Carex* affords many examples. Tuckerman, in 1843, designated a plant which he took to be a form of *Carex scoparia*, as var. *moniliformis*, and another one thought to belong to *C. straminea* as var. *moniliformis*. Subsequently, Olney determined that the latter is a distinct species, and called it *Carex silicea*. Shall we now overturn the oldest specific name (*silicea*),—as is done in the *Catalogue of Plants of New Jersey*,—and make an old varietal name a specific one? Shall we make Tuckerman say that he was mistaken, and compel him, even indirectly, to raise his variety into a species?

Carex moniliformis is not Tuckerman's. It is Britton's, and dates from 1889. Olney's name dates from 1868, and I see no other way than to make Britton's name a synonym of Olney's, as we have already done with recent names for all species. And if the var. *moniliformis* of *C. scoparia* should be erected into a species—what then?

"They tell me that if botanists had always followed the methods of zoologists, using the oldest specific name in whatever genus, we should have been all right now. But, as we did not start in this way, I do not see the force of the statement.

"One of the most mischievous features of the whole thing is the ease with which authors of local floras obtain a cheap notoriety by making new combinations,—which will likely be changed by the next cataloguer,—and the extent to which it fosters the notion that making a new name and differing from an authority are the chief ends of systematic botany."

We have nothing to add to this clear statement of the position, and we have little doubt that the rational views it advocates will ultimately prevail. The warning in Prof. Bailey's last paragraph —that the new combinations "will likely be changed by the next cataloguer"—has been fully exemplified by the action of Dr. Britton. May we then suggest, to him and his followers, that it will be desirable to wait a little before revolutionising for a second time, so far as is in their power, botanical nomenclature; and before adding to our already overburdened lists a mass of synonymy which can serve no useful purpose.

Our Country's Flowers, and how to know them: being a complete Guide to the Flowers and Ferns of Britain. By W. J. Gordon. With an Introduction by the Rev. G. Henslow. Illustrated by John Allen, with over one thousand examples in colour and outline. London: Day & Son. [1891.] Pp. v. 154. 6s.

It is impossible to withold a tribute of praise to the ingenuity displayed in this little work. It does not indeed merit the flattering rather than critical estimate formed of it by the large number of (mostly local) newspapers cited in the advertisements; but it contains a great deal of information, is of convenient size, and is free from the inaccuracies which usually disfigure books of the kind.

The first chapter is devoted to an alphabetical list of "local names" of plants, evidently taken without discrimination from the *Dictionary of English Plant-names*, though this is not stated, and occasionally including plants which are not British. Then we come to "Classification," followed by a "Tabular Scheme," and a chapter on the "Natural Orders." Then come "Examples of Identification," followed by a Glossary, and "Contents of the coloured Plates." The 33 plates are crude in colouring, and terribly crowded; the frequent placing of the numbers on the petals of the plants gives them an odd appearance. In many cases, as it seems to us, a knowledge of the plant is required before

its representation can be identified—although this is the opposite of what might be expected: the orchids especially are as badly coloured as in the third edition of *English Botany*.

After the plates, we have three indexes,—one of orders, one of genera, and one of species,—all arranged alphabetically. The genera are illustrated by small and rather rough figures, illustrating different parts of the flowers, and thus not easily comparable. In *Orchideæ*, for example, of some genera the pollinia, of others the whole flowers, are given; sometimes, as in *Colchicum*, we fail to understand what is meant. The correlation of one part of the book with another is done with great care; but in our judgment the little volume is too scientific for the ordinary amateur, who will hardly have patience to use the various tables, and will assuredly come to grief if he trusts to the pictures; while the botanist will prefer the more systematic arrangement of any one of the recognised hand-books.

Manipulations de Botanique Médicale et Pharmaceutique. Par Dr. J. Hérail & Mons. Valère Bonnet. Avec 36 planches colorées. Paris: J. B. Baillière et fils. 1891. Pp. 320.

The term materia medica, as applied to works treating of drugs, has almost entirely lost its former signification. Articles of materia medica of mineral origin, and the active principles of those of vegetable origin, have been relegated to the domain of chemistry, and the knowledge of the distinctive features of simple vegetable drugs has been reduced to a branch of Botany, called in Germany "pharmacognosy," and in France "histology." It is no longer sufficient for the student to recognise drugs by their general appearance. The advance of knowledge requires that he should be familiar with the anatomy of plants, and be able to ascertain the freedom of drugs from adulteration by means of the microscope. The present work may be regarded as representing the character of the teaching in the École Supérieure de Pharmacie at Paris, since Dr. Hérail formerly directed the practical studies in materia medica there, and M. Bonnet prepared the illustrations; whilst the preface is by Prof. Planchon, the Director of that institution.

The first half is divided into four chapters, which treat respectively of (1st) the microscope and methods of using it; (2nd) the structure, contents, and forms of the cell; (3rd) the tissues, their origin and varieties; (4th) the organs of the plant. These chapters are very carefully written in the lucid style characteristic of the French, as contrasted with the long and often involved sentences of the Germans, and form an excellent readable summary of the subjects on which they treat. The illustrations are numerous, beautifully executed, but sufficiently diagrammatic to give a clear notion of what the student should look for, since it is needless to say that only long practice renders it possible to cut such perfect sections as are represented. In most cases they are taken from familiar medicinal or economic plants, but a few, such as *Ceropegia*, *Periploca græca*, and *Bragantia tomentosa*, might well have been replaced by others from plants used in pharmacy or medicine.

In the second part, the special histology of medicinal plants is treated under the various organs, *viz.*, roots, stems, leaves, flowers, fruits, and seeds. In this manner an instructive comparison is more easily obtained. Considerable judgment has been used in placing side by side sections of drugs which are somewhat similar to the naked eye, but unlike under the microscope, or which, on the other hand, may be unlike in general appearance, but very similar under the microscope. A great advantage is also obtained by indicating the different tissues in faint tints of green, brown, &c. Under each drug a brief account of the botanical origin and medicinal use is given, with a full description of the physical appearance and properties, and an excellent summary of the distinctive histological features of each drug.

The microscopical drawings by M. Bonnet are all that could be desired, but the small cuts of the plants or drugs are somewhat crude, and in a few instances the names under these have been misplaced; thus, on p. 245, the leaves of *Conyza* are labelled *Digitalis*, and *vice versa*: the names white mustard and black mustard are similarly transposed, and the figure of "Cigue officinale" is evidently not that of hemlock, since it represents the three long pendulous bracts under each partial umbel, characteristic of *Æthusa Cynapium*. The figure of phyllary of *Semen Contra* (p. 276) would hardly be recognised by anyone who has seen the object under the microscope. With these few exceptions, the work is well done. For English readers, it has the defect that the botanical names used in France are in many cases different from those in use in this country, e. g., *Chasmanthera palmata* H. Bn. for calumba; aud some of the drugs, such as turbeth root (*Ipomæa Turpethum* R. Br.), are almost unknown in this country. Nevertheless the work is so clearly written, and the characteristic features of drugs as seen under the microscope are so carefully emphasised, that it cannot fail to be found exceedingly useful to the student of vegetable materia medica. E. M. Holmes.

An Introduction to the Study of Flowerless Plants. By Alfred W. Bennett, M.A., B.Sc. London: Gurney & Jackson. 8vo, pp. 86, 36 cuts. Price 1s. 6d.

This is a reprint of the section of Henfrey's *Elementary Course of Botany* which deals with Flowerless Plants. It is undertaken at the instance of the National Home Reading Union, and Mr. Bennett has written for this separate issue "such an introduction as is needed to make this little book independent." The members of the reading-circles in connection with the N. H. R. U. must have made considerable progress in their studies if they can tackle such tough literature as this; and the Council are, we presume, of the same opinion, as we understand that Mr. George Murray has undertaken to prepare for the Journal of the Union a series of papers which will be introductory to this *Introduction*. More advanced students will, however, find this a handy little compendium of the subject. There is no glossary, and no index—not

even a table of contents: omissions of this kind should be made penal; or, at the very least, books without indexes should be severely boycotted by all who have the interests of humanity at heart.

NEW BOOKS.

Boleslaw, K.—'Distributio plantarum vasculosorum in montibus Tatricis.' 8vo, pp. 513. Kraków.

Hoffstad, O. A.—'Norsk Flora.' 8vo, pp. xxxii. 222. Bergen: F. Beyer.

Krabbe, G.—'Entwicklungsgeschichte und Morphologie der polymorphen Flechtengattung Cladonia.' 4to, pp. viii. 160, tt. 12. Leipzig: Felix.

Smith, W. G.—'Supplement to British Fungology.' 8vo, pp. xii. 386. London: L. Reeve. 12s.

Solms-Laubach, H. (Transl. by H. E. F. Garnsey). — 'Fossil Botany.' 8vo, pp. xii. 401, 49 cuts. Oxford: Clarendon Press. 18s.

Trabut, L.—'Précis de Botanique Médicale.' 8vo, pp. 699, 830 cuts. Paris: Masson.

Velenovský, J.—'Flora Bulgarica.' 8vo, pp. ix. 676. Prague: Rivnác.

Woodhead, G. S.—'Bacteria and their Products.' 8vo, pp. 459. London: Walter Scott. 5s.

ARTICLES IN JOURNALS.

Annals of Botany (Aug., 15s.).—D. H. Campbell, 'Life-history of *Isoetes*' (3 plates).—D. H. Scott & G. Brebner, 'Internal Phloem in root and stem of Dicotyledons' (3 plates). — J. G. Baker, 'New Ferns discovered or described since 1874' (contd.). — G. F. Scott Elliot, 'Fertilisation of S. African and Madagascar Flowering Plants' (3 plates). — W. B. Hemsley, '*Rhynchosia? antennulifera* Baker' (*R. Holubii*, sp. n.). — S. H. Vines, 'A diastatic ferment in green leaves.'

Annales Sci. Nat. (Aug.). — L. G. Chauveaud, 'Recherches embryogéniques sur l'appareil laticifère des Euphorbiacées, Urticacées, Apocynées, et Asclépiadées' (12 plates).

Bot. Centralblatt (Nos. 34–37). — R. Keller, 'Beiträge zur schweizerischen Phanerogamenflora.' — (No. 34). P. Knuth, 'Die Fichte, ein ehemaliger Waldbaum Schleswig-Holsteins.' — V. B. Wittrock, 'Ueber das Bergian'sche Herbarium.' — (No. 35). J. Klein, 'Ueber Bildungsabweichungen an Blättern.' — L. Almquist, 'Ueber die Formen der *Carex salina*.' — (No. 38). J. R. Jungner, 'Anpassungen der Pflanzen an das Klima in den Gegenden der regenreichen Kamerungebirge.'

Bot. Gazette (Aug. 15). — T. Holm, 'Anatomical characters of N. American Gramineæ' (*Uniola:* 2 plates).—J. C. Arthur, 'Notes on Uredineæ.'—F. L. Scribner, 'Flora of Orono, Maine.'—'*Melica? multinervosa* Vasey, n. sp.' '*Eriogynia Hendersoni* Canby, n. sp.'

Bot. Magazine (Tokio: Articles in English: May).—R. Yatabe, *Acrostichum tosaense*, sp. n. (1 plate).—(June). Id., *Prasiola japonica*, sp. n. (1 plate).

Bot. Notiser (häft. 4).—R. Fries, 'Om svampfloran i vara växthus.'—N. Johanson, 'Bidrag till Skånes Flora.'—F. Laurell, 'Schematisk Öfversikt öfver de med obeväpnadt öga iakttagbara vegetativa genuskaraktärerna hos Skandinaviens på fritt land odlade Koniferer.'

Bot. Zeitung (Aug. 28–Sept. 18). — L. Jost, 'Ueber Dickenwachsthum und Jahresringbildung.' — C. Wehner, 'Entstehung und physiologische Bedeutung der Oxalsäure im Stoffwechsel einiger Pilze.'

Bull. Soc. Bot. France (xxxviii. Comptes rendus 5: Sept. 1).—E. Bornet, 'Algues du département de la Haute-Vienne.' — M. Giraudias, '*Anemone Janczewskii*, sp. n.'— —. Copineau, '*Ophrys Pseudospeculum*.' — G. Rouy, 'Espèces nouvelles pour la Flore Française.' — H. Bocquillon, '*Gonolobus Condurango*.' — D. Clos, 'Interprétation des parties germinatives du *Trapa natans*, de quelques Guttifères, et des *Nelumbium*.' — G. Rouy, '*Euphorbia ruscinonensis* & *Hieracium Locosianum*.'—G. Camus, '*Orchis Boudieri* (*latifolia* × *Morio*).' — F. Camus, 'Glanures bryologiques dans la Flore Parisienne.' — J. A. Battandier & L. Trabut, 'Voyages botaniques en Algérie.'

Gardeners' Chronicle (Sept. 5). — *Neobenthamia gracilis* Rolfe (n. gen. et sp.: fig. 33). — (Sept. 12). *Coelogyne Micholiziana* Kränzlin, sp. n. — (Sept. 19). E. J. Lowe, 'Ferns and their multiple parents.'—(Sept. 26). M. T. Masters, '*Cupressus arizonica*.' —R. A. Rolfe, '*Cattleya labiata*.'

Journ. Linn. Soc. (xxix. 197: Aug. 22). — G. F. Scott Elliot, 'New and little known Madagascar Plants' (12 plates).

Oesterr. Bot. Zeitschrift. (Sept.). W. Figdor, 'Ueber die extranuptialen Nectarien von *Pteridium aquilinum*.'—H. Braun, 'Uebersicht der in Tirol bisher beobachteten Arten und Formen der Gattung *Thymus*.' — A. V. Degen, 'Ergebnisse einer botanischen Reise nach der Insel Samothrake.'

BOOK-NOTES, NEWS, &c.

Can any Yorkshire reader or student of roses throw light on the following paragraph, which we clip from a recent issue of the *Daily News*?—"One of the Wars of the Roses, the fiercest and deadliest of them all, was fought on a field where, curiously enough, a rose

peculiar to the spot grows or used to grow. It is a rare plant now, and the reason is explained by Mr. Leadman in his account of Yorkshire battles, *Prælia Eboracensia*. After describing the terrible conflict at Towton on Palm Sunday, 1461, he says:—'I cannot conclude this story of Towton Field without an allusion to the little dwarf bushes peculiar to the "Field of the White Rose and the Red." They are said to have been plentiful at the commencement of this century, but visitors have taken them away in such numbers that they have become rare. Such vandalism is simply shameful, for the plants are said to be unique, and unable to exist in any other soil. The little roses are white, with a red spot on the centre of each of their petals, and as they grow old the under surface becomes a dull red colour.'"

Messrs. G. P. Putnam's Sons, of London and New York, have issued in a handsome five-shilling volume a sketch of *Charles Darwin, his Life and Work*, compiled by Mr. C. F. Holder. It is intended for "young readers as well as old," and although the style is better adapted to the latter than the former, the book may certainly be regarded as the most complete popular life of our great naturalist. The plates are taken from various sources, and add greatly to the attractiveness of the book. The last chapter is devoted to a summary of addresses upon Darwin exclusively by "American scientists," some of whom are not familiar, even by name, to the British reader: surely, in a work published in this country, some notice should be taken of the various tributes paid to him by his fellow-countrymen, many of which contained personal details which the transatlantic writers could not be expected to supply. There is a useful appendix containing a list of Darwin's works, and a somewhat insufficient index.

The series of Botanical Diagrams now being issued by the Society for Promoting Christian Knowledge should have been noticed before this. Although by no means as advanced as various German diagrams which have obtained a deservedly high reputation, they will be found extremely useful for village schools where some attempt is made, on the lines laid down by the late Prof. Henslow, to instruct and interest the children in the commoner wild and garden flowers. We do not quite understand what principle has governed the selection: three sheets out of the twelve are devoted to the *Solanaceæ*. The diagrams are published at a shilling each—the price, by the way, of Mr. Carruthers's "potato-disease" sheet, referred to at p. 256, and there said in error to be issued at sixpence.

The August number of the *Bulletin of Miscellaneous Information*, issued by H. M. Stationery Office, contains descriptions by Mr. Rolfe of ten new Orchids. It is desirable to call the attention of systematists to this new departure in the contents of the *Bulletin*, in order that these novelties, which are to be followed by others, may not be overlooked. The species described are—*Physosiphon guatemalensis*, *Bulbophyllum denticulatum*, *B. nigripetalum*, *Megaclinium Clarkei*, *M. leucorhachis*, *Pholidota repens*, *Pelexia olivacea*, *Polystachya bulbophylloides*, *Epidendrum Mooreanum*, and *Renanthera*

Imschootiana. Even if we were not deterred by the minatory "All Rights Reserved," which heads each number of the *Bulletin*, and which seems strangely inconsistent with the liberality which should characterise a scientific publication, our space would not allow us to reproduce these descriptions; but this notice may render them accessible to botanists who might not otherwise be aware of their existence.

The same number of the *Bulletin* contains an article on the important question of 'Orchid Nomenclature,' in the course of which Prof. Reichenbach's will is somewhat severely animadverted upon. It was a matter for regret that the Kew authorities were unable to take part in the deliberations of the Committee appointed by the Royal Horticultural Society to consider this question; but Dr. Dyer, in a letter (which is appended to the article) pointed out that "the absence on extraneous duties of those who work during prescribed official hours is contrary to the regulations of the Civil Service." We are glad to notice that these regulations, which seemed a little strained in a case like the foregoing, have since been relaxed; and that Mr. Baker, Mr. Nicholson, and Mr. Dewar, all of the Kew staff, will take part in the R. H. S. Conference which meets at Chiswick at 2 p.m. on Oct. 6–8.

The most important part of the Conference, from a botanical point of view, will be that devoted to Conifers. This will be opened on the 7th by Dr. Masters, who occupies the chair, with a paper on the special features of interest which these trees present. On the same day, Messrs. H. J. Veitch, G. Nicholson, E. J. Baillie, and others will read papers. On the 8th, Prof. Balfour will preside, and papers will be read by Prof. Marshall Ward and others. It is hoped that a fine series of illustrative specimens of all kinds, living and dead, will be brought together, and the exhibition should prove an interesting one. We are informed that the Secretary of the R. H. S. will gladly forward cards of invitation on application—address, 117, Victoria Street, S.W.

The *Daily Graphic* stands in urgent need of a botanical editor. On September 15th it figured a group of Sarracenias as "*orchids* raised in the Dublin Botanic Gardens"; and in the issue of Sept. 23rd, in an account of what seems to have been a very poor show of insectivorous plants by the Royal Horticultural Society, we read of the "Nepenthe" whose "treacherous pitcher-shaped flowers (!)" poison insects by their juices; of "the Sunda, which is a botanical glutton"; of "the Sarrascenia family," which "kill and consume certain small creatures," although "there are varieties of moths which can enter their uncanny looking curves and recesses with absolute safety"; of "Cypredium," and the like. This carelessness or ignorance (or both) is inexcusable in a paper of recognised position.

Mr. Dyer, the Director of Kew Gardens, has received the honorary degree of Doctor of Philosophy from the Imperial Leopoldine-Caroline Academy.

Mr. Arthur Cottam has contributed to the *Standard* (Sept. 5) a list of flowering plants found by him on the site of No. 8, Whitehall, within a quarter of a mile of Charing Cross. No grasses are included, so that the list might be considerably extended: *Pteris Aquilina* "has come up in considerable patches on all parts of the site." The list includes the following:—*Sinapis arvensis, Sisymbrium officinale, Capsella Bursa-pastoris, Stellaria media, Arenaria serpyllifolia, Sagina procumbens, Trifolium repens, Prunus Cerasus, Epilobium angustifolium, E. hirsutum, E. parviflorum, Carduus lanceolatus, C. arvensis, Arctium Lappa, Matricaria inodora, Anthemis Cotula, Senecio vulgaris, S. viscosus, Erigeron canadensis, Tussilago Farfara, Hypochœris radicata, Taraxacum Dens-leonis, Sonchus arvensis, S. oleraceus, Solanum tuberosum, Lycopus europæus, Plantago major, P. lanceolata, Atriplex patula, Polygonum Convolvulus, P. aviculare, P. Persicaria, Populus nigra, Salix aurita.*

The seventh volume of DeCandolle's *Monographiæ Phanerogamarum* contains the *Melastomaceæ*, which are elaborated by Prof. Cogniaux, who monographed the Brazilian species for the *Flora Brasiliensis*. The work contains 1256 pages; 2731 species and 555 varieties are described, of which 793 and 465 are new. Eight new genera are established—*Schwackæa, Benevidesia, Bisglaziovia, Barbeyastrum, Beccarianthus, Boerlagia, Brittenia*, and *Medinillopsis*.

An extremely modest contribution to local botany, both in appearance and price (3d.), is the *Flora of Oswestry and District*, by Mr. T. P. Diamond, Hon. Sec. of the Offa Field Club. This Club was formed about four years ago by a few tradesmen and workingmen, with the object of inducing shop-assistants and others to spend their half-holidays in country walks and in the study of the natural history of the district; and this object has been in some measure attained. The list contains more than 700 species, and, although the claims of admission of one or two are somewhat doubtful, it is evident that much care has been exercised in its compilation. There is a full index, to which the Welsh names—often mere translations—are added. The printing is very creditable; and if the little work (containing sixty pages) pays its way at the small sum above named, it is to be hoped that other local societies will follow the example of the Offa Club. The publishers are Messrs. Woodall, Minshall & Co., Oswestry.

The Smithsonian Institution has issued in quarto form twenty-four coloured plates, prepared by Sprague between 1849 and 1859, to accompany a Report on the Forest Trees of North America by Asa Gray. The Report, for various reasons, was never published, and the plates before us "are now presented to the public at the request of some of our leading botanists as possessing great merit and value, even without any descriptive text." This estimate is by no means too high; the figures are beautifully drawn and coloured, and will form a worthy memento of "the distinguished man who gave so much of his life and labours to this department of knowledge."

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JAMES BRITTEN, F.L.S.,

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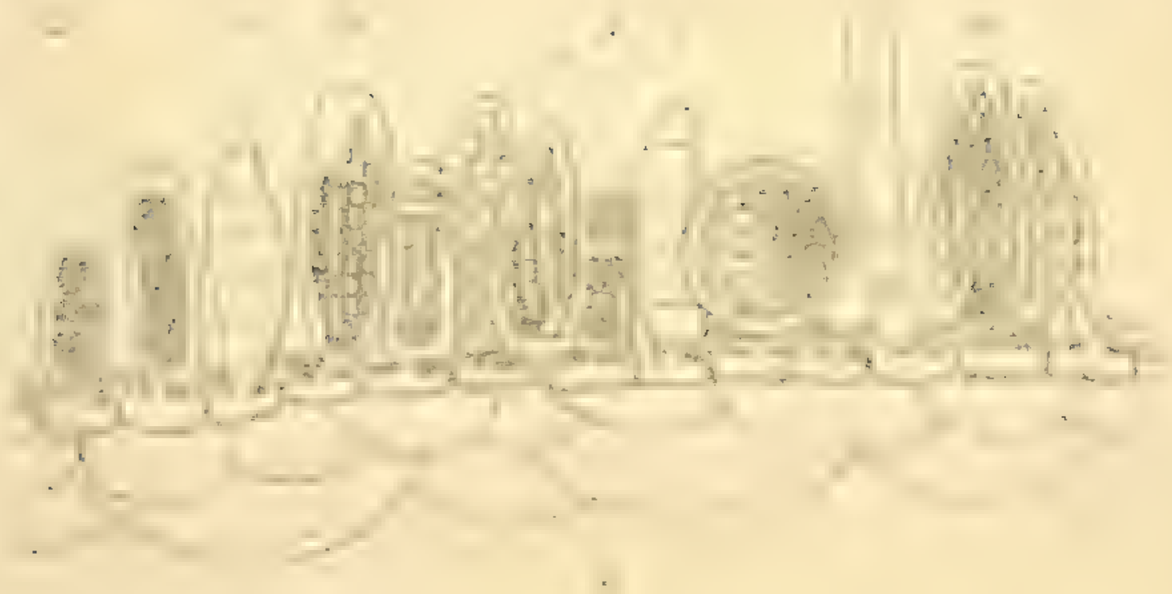
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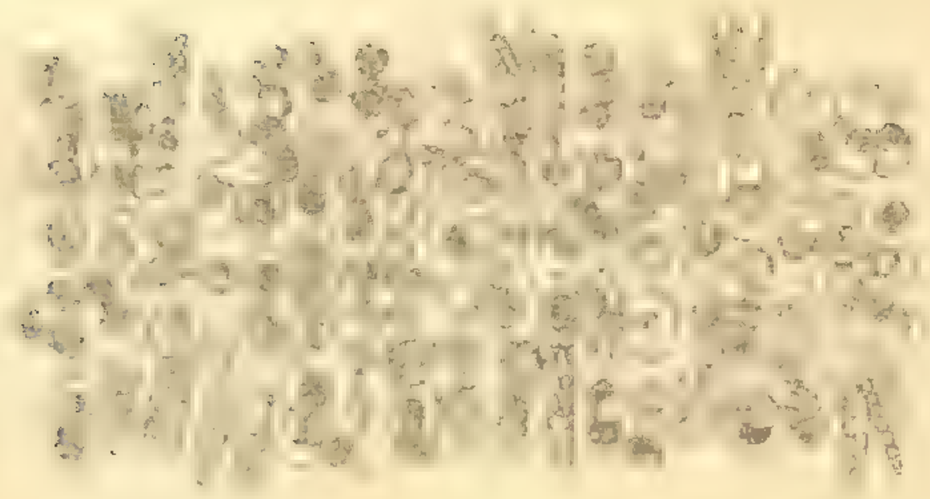














Pentacrinus baliolus Lamour
Variolaria davæformis Harv

THE PLURILOCULAR ZOOSPORANGIA OF *ASPEROCOCCUS BULLOSUS* AND *MYRIOTRICHIA CLAVÆFORMIS*.

By T. H. Buffham, A.L.S.

(Plate 314.)

Although many of the species of the brown seaweeds now included in the *Phæosporeæ* or *Phæozoosporeæ* are known to possess both unilocular and plurilocular zoosporangia, and the number is continually increasing, there still remain a considerable number even of genera the reproductive organs of which—so far as our knowledge goes—are confined either to one form or the other. Since the copulation of zoospores (gametes) from the plurilocular sporangia has been observed in several species additional interest accrues to the question whether in reality all, or nearly all, of this numerous group of algæ may not ultimately prove to possess both forms of sporangia.

Asperococcus Lamour. is a genus which apparently has heretofore exhibited only the unilocular form of sporangia. Beautiful representations of *A. bullosus* Lamour., and of these sporangia as seen in a section through a sorus, are given in *Études Phycologiques* (pl. VI) by Thuret and Bornet, who describe them and the germination of the zoospores (p. 17).

In Aug. 1890 I picked up, floating in the sea at Studland, Dorset, in the estuary called Poole Harbour, a specimen consisting of two fronds arising from one root-disc. Both were worn away at the apices from dissolution: the longer one probably not much, as it was $2\frac{1}{2}$ inches (6 cm.) in length; the other much more, being reduced to $1\frac{1}{2}$ inches (4 cm.). Of course these were not inflated, the ends being open, and the width of the flattened frond was about ·4 inch (1 cm.). Nothing unusual was observed with a pocket-lens, but on examination with the microscope the surface appeared to differ from specimens producing unilocular sporangia, and a section showed groups of bodies of the plurilocular character, and it naturally occurred to me that they might belong to some epiphyte rather than to the *Asperococcus*. Subsequent study, however, renders it quite clear that they are the true plurilocular sporangia of *A. bullosus*. They are perpendicular to the surface, sessile, ellipsoidal or somewhat ovoid, 55–65 μ long by 20–25 μ in greatest diameter, and more or less crowded in sori, and intermixed with a few short paraphyses (assimilation-threads) and hairs. On carefully examining the whole of the fronds a single unilocular sporangium has been found in a few of the sori. Had these been seen at first the specimen might have been thought to be an immature plant of the usual kind. On comparison with specimens collected a few days afterwards at Swanage the surface view, even with so low a power as 100, is perceived to be different. The plurilocular sporangia (seen in optical transverse section) are smaller, of a warm brown rather than greyish-brown colour; the

apices of the paraphyses are not so dark, and are smaller, less numerous, not so high, and far less obtrusive. Such a view of a small sorus, including empty sporangia, is shown in fig. 1. A section through a larger sorus containing sporangia of different ages is drawn in fig. 2. Lastly a mature sporangium is seen in fig. 3.

Thuret and Bornet (*op. cit.* p. 14) have pointed out the difference between the unilocular sporangia of *Punctaria* and *Asperococcus*, and Dr. Ed. Bornet has recently suggested to me that the plurilocular forms here described resemble much more those of *Desmotrichum* (Kütz.) Reinke than those of *Punctaria*. (*Vide* Reinke's figs. of *D. undulatum* (Ag.) Reinke in *Atlas deutscher Meeresalgen*, Taf. 11, and Thuret's of *P. latifolia* Grev. in *Études Phycologiques*, pl. V.)

Myriotrichia clavæformis Harv. is well known to vary very considerably in its branching, both as to the length of the primary branches, and the manner and extent in which these again branch. The aspect of the form bearing the plurilocular zoosporangia is so different from that of the specimens bearing the unilocular zoosporangia that at first I could not determine to what known British species my specimens should be referred. They were found growing on *Zostera* in the little harbour of Swanage, Dorset, Aug. 1887. From a spreading disc of interlacing fibres thin filaments arise of $\frac{1}{2}$ inch (12 mm.) to 1 inch (25 mm.) in height, almost black, attenuated at the base; a short distance above the base they reach their largest diameter of about ·2 mm. and have the appearance of an almost solid cylinder crossed at right angles with close rows of dark dots. A transverse section shows these to be apices of very short compound branches of 2 or 3 rounded cells arising from an axis formed of a number of cells of somewhat hexagonal outlines with some minute plurilocular sporangia amongst these branches.

At this juncture Dr. Bornet, to whom I submitted specimens, kindly determined them to be the species just named. The most recent authors including Hauck (*Die Meeresalgen Deutschlands und Osterreichs*, p. 336) state that the plurilocular sporangia are unknown, but they have apparently been known for some time to the distinguished French algologist. In these specimens the sporangia are nearly all single, but in some plants collected near the same station three years later (Aug. 1890) I find them much more numerous, and not only single, but in clusters of three or four arising from one cell of a branch, and some are divided or forked. They can sometimes be detected not far from the base of the plant, even in a thin specimen (fig. 5). The plants of last year are thicker, and evidently more mature, than those collected in 1887, and in the surface view of the plant the cells of the branches seem smaller and paler. In the thicker parts of the plant portions of many sporangia project (fig. 6). A transverse section here (fig. 7) shows more elongated branches and cells, and many of the sporangia arise from the terminal cells. Not only do they vary in arrangement but also in form (figs. 8-11), many being nearly cylindrical up to 60 μ long and 7 μ in diam., while others are as short as 25 μ

and somewhat lanceolate. The typical mature sporangium would seem to be of this form, about 60 μ long and 10 μ in widest diam. (fig. 12), and these contain two rows of zoospores. In the cylindrical form generally only one row is observed.

Hauck describes these zoosporangia in *M. adriatica* Hauck (*op. cit.* p. 337) as cylindrical, about 30–40 μ long, and 8–12 μ thick, containing one row of zoospores, but this plant must be very different from *M. clavæformis*, and, curiously, the unilocular zoosporangia were unknown to him.

Note.—Since the foregoing was written Dr. Bornet has informed me that he considers *Myriotrichia filiformis* Harv., now generally regarded as only a variety of *M. clavæformis* Harv., to be a distinct species, as the plurilocular sporangia (of which he sent a sketch) differ in the two forms. Through the kindness of Mdlle. N. Karsakoff, of Paris, who in July communicated specimens of *M. filiformis* collected at Roscoff, Finistère, (a district made classic by the prolonged work of the brothers Crouan) I am enabled to say that in this species the sporangia form dense masses, more or less extended, surrounding the filament of the plant at intervals. They are broadly conical or lanceolate, about 25 μ high by 16 μ near their base. More recently still (Aug.) I have collected at Sidmouth many specimens in various stages.

Explanation of Plate 314.

Fig. *Asperococcus bullosus* Lamour., figs. 1—3.

1. Surface view of a small sorus × 100.—*a*. Mature plurilocular zoosporangia. *c*. Do. empty. *d*. Paraphyses. *e*. An immature unilocular sporangium. *f*. Hairs.
2. Vertical section through a larger sorus × 100.—*b*. A mature plurilocular zoosporangium, some of the zoospores already discharged. The other lettering as in fig. 1.
3. Mature plurilocular sporangium × 200.

Myriotrichia filiformis Harv., figs. 4—12.

4. A group of plants with plurilocular zoosporangia on *Zostera*, n. s.
5. Two plurilocular sporangia on the lower part of a thin plant × 100.
6. Surface view of the thick part of a mature plant with plurilocular sporangia × 100.
7. Part of transverse section of the same × 200.
8, 9. Simple forms of plurilocular sporangia × 400.
10. A divided or forked one × 400.
11. A cluster of three, of which one is empty, arising from a terminal cell of a branch × 400.
12. Mature typical sporangium × 400.

All from specimens preserved in a saturated solution of *sodium chloride*.

ANCIENT AND UNVERIFIED KERRY RECORDS.

By Reginald W. Scully, F.L.S.

Few Irish counties have been troubled with more erroneous records than Kerry. The beautiful scenery of this county, no less than the interest attaching to its remarbable group of plants characteristic of the West and South of Europe, have combined to attract nearly every botanist of note, and many others besides. The result has been the accumulation of many records that cannot now be verified. Some of these are obvious errors, others probably the result of hasty determination, mixing specimens from other districts, or writing from memory.

The worst offender is Dr. Charles Smith, the author of *The Antient and Present State of the County of Kerry*, which he published in 1756; he also wrote similar Histories of Cos. Cork and Waterford. All three works contain curious and rather startling lists of "rare and useful" plants growing in each county. Whether Dr. Smith wrote from his own knowledge, or merely accepted the records and statements of others, is impossible to determine; very little information can now be found concerning him. But, even allowing for the scarcity of works on Botany, and the general ignorance on the subject 140 years ago, it is hard to account for the many errors he seems to have fallen into.

His list of "rare and useful" plants growing in Kerry contains 104 pre-Linnean formulæ; turning these into modern phraseology, they seem to include 97 of the Phanerogamia and higher Cryptogams, 2 Mosses, and 3 Lichens, with duplicate descriptions or varieties of two of the Ferns. Of these 97, about 33 certainly do not deserve their places in his list owing to their rarity, being as abundant in Kerry as elsewhere in Ireland. In the following list I have retained the numbers prefixed by Smith to his plants, to aid in the identification of the species intended, often a difficult matter. These 33 common plants are:—

50. *Hypericum Androsæmum.*
38. *Geranium molle.*
41. *G. Robertianum.*
7. *Ilex Aquifolium*, var.
84. *Rubus Idæus.*
19. *Geum rivale.*
75. *Potentilla Comarum*, var.
82. *Rosa canina.*
74. *Saxifraga tridactylites.*
83. *Drosera rotundifolia.*
32. *Eryngium maritimum.*
71. *Œnanthe crocata.*
37. *Galium verum.*
103. *Solidago Virgaurea*, var.
20. *Anthemis nobilis.*
67. *Lycopus europæus.*
98. *Thymus Serpyllum.*
13. *Beta maritima.*
15. *Suæda maritima.*
53. *Salsola Kali.*
97. *Taxus baccata.*
79. *Potamogeton pectinatus.*
44. *Agrostis alba*, var.
45. *Aira præcox.*
43. *Agropyron repens*, var.
5. *Asplenium Adiantum-nigrum*
21. *A. marinum.*
100. *A. Trichomanes.*
3. *A. Ruta-muraria.*
77. *Scolopendrium vulgare*, var.
28. *Equisetum maximum.*
30. *E. palustre.*
92. *Lycopodium Selago.*

About 23 others are known to occur in the county, and most of them may perhaps be numbered among its rarer or more local species; they are—

39. *Erodium moschatum.*
81. *Rhamnus catharticus.*
91. *Saxifraga umbrosa.*
95. *Smyrnium Olusatrum.*
36. *Fœniculum officinale.*
26. *Sambucus Ebulus.*
85. *Rubia peregrina.*
47. *Inula Helenium.*
24. *I. crithmoides.*
49. *Crepis paludosa.*
25. *Hieracium umbellatum?*
9. *Arbutus Unedo.*
80. *Mentha Pulegium.*
98. *Euphorbia hiberna.*
63. *Humulus Lupulus.*
52. *Juniperus communis.*
101. *Asplenium viride.*
22. *Ceterach officinarum.*
33, 34. *Cystopteris fragilis* & var.
35, 73. *Osmunda regalis.*
72. *Ophioglossum vulgatum.*
29. *Equisetum hyemale.*
65. *Lycopodium clavatum.*

Of the 56 species contained in these two lists, I have myself gathered all, except *Inula crithmoides.*

Of the remaining 41 plants, 20 are not known to occur anywhere in Ireland, except two or three of them which have escaped from cultivation; these are—

17. *Arabis stricta?*
16. *Draba muralis.*
96. *Sorbus*, sp. (was probably *Pyrus Aria*).
8. *Seseli Libanotis.*
76. *Peucedanum officinale.*
104. *Xanthium Strumarium.*
2. *Artemisia campestris.*
51. *Senecio campestris.*
23. *S. palustris.*
62. *Statice Limonium* (no doubt *S. rariflora* was the plant intended).
70. *Lysimachia Nummularia.*
102. *Polemonium cæruleum.*
90. *Scrophularia Scorodonia.*
48. *Herniaria glabra?*
88. *Salix reticulata.*
87. *Juniperus Sabina* (perhaps *J. nana* was meant).
86. *Ruscus aculeatus.*
61. *Convallaria majalis.*
46. *Paris quadrifolia.*
4. *Cystopteris alpina.*

Finally, there remain 21 plants of which we have no recent Kerry record, though they all occur in other parts of Ireland. A few of these may perhaps yet be found, and a few others have died out, but there can be little doubt that the majority of these records are simply errors; I give them in full, however, with their reported localities, in the hope of their possible rediscovery.

56. *Mathiola sinuata.* "Near Beal Castle, Shannon-mouth." Not there now, I think; a very rare and decreasing species in Ireland.

55. *Lepidium latifolium.* "Near the head of Kenmare River, and on other parts of the sea-shore." I have not yet seen this conspicuous plant in Kerry.

64. *Silene acaulis.* "On the rocky mountains in Dunkerron, near Blackstones." The only Blackstones I can find in the county is near Caragh Lake, Glencar, in the barony of Dunkerron North.

No mountains likely to afford a home to *S. acaulis* exist near Blackstones, and, though the Reeks are not very far off, these mountains have been too well worked to allow of the chance of the *Silene* having been overlooked. No doubt many parts of the two very wild baronies of Dunkerron North and South have not been, even yet, properly searched; however, I am afraid this record must be numbered among Smith's errors.

40. *Erodium maritimum.* "On the strand of Tralee, near the Spa, and other places." Recorded from Cork, and a likely plant to occur in Kerry, but not yet noticed by any recent observer.

10. *Astragalus Hypoglottis.* "On the mountains round Killarney Lough." In Ireland only known on the Arran Islands.

78. *Lathyrus maritimus.* Recorded by Smith from Kerry about 1750, and seems to have been gathered in his locality by Mackay in 1804, and several times subsequently. The plant has apparently died out at this, its only Irish station. *Vide* Journ. Bot. March, 1889, p. 86.

18. *Dryas octopetala.* "On the hills near the passage into the Upper Lake of Killarney." This is a plant preferring trap and limestone rocks in Ireland, and neither of these occur near the passage into the Upper Lake. The limestone at Killarney ceases on the north side of the Middle Lake, where the locality is quite suitable, and similar to places in the Burren district, Co. Clare, where I have seen this plant growing in great abundance. As stated in the *Cybele Hibernica*, Lhwyd notices its occurrence in Munster, but gives no locality.

89. *Saxifraga oppositifolia.* "Among the rocks near Blackstones." Probably the same locality meant as that given for *Silene acaulis*, while the same remarks hold good for both records.

42. *Diotis maritima.* "On the shores of the strand at Ballyheigh." I cannot find it there now. A very rare and probably decreasing species in Ireland.

99. *Tragopogon porrifolius.* "Near Lixnaw, on the bank of the River Brick." No recent Kerry record, and in no case a native.

54. *Andromeda Polifolia.* "In several bogs in Iveragh and Dunkerron baronies." A likely plant to occur, and Mackay mentions it among his Kerry records, but I know of no recent observation.

31. *Dabœcia polifolia.* "A common plant on the mountains, and observed by Mr. Ray to grow also in Air-Connaught, County of Mayo." Some mistake on Smith's part; the plant is confined to the counties Galway and Mayo.

27. *Mertensia maritima.* "On the beach near Beal Castle." Not there now; a decreasing species in Ireland, and apparently extinct also on the Murrough of Wicklow, a locality long known for it.

60. *Echium vulgare.* "Sandy grounds of Ballyheigh Bay, not far from Fenit." No recent observation.

94. *Galeopsis versicolor.* "Fields near Castleisland." Not recently observed.

11. *Atriplex littoralis.* "On the banks of the River Galey, plentifully." Only known, so far, from the east side of Ireland.

12. *A. portulacoides.* "Near the exit of the River Mang, not far from Calnafersy." Not recently observed.

14. *Polygonum Bistorta.* "In Sir Thomas Denny's Park, near Tralee." Not there now; but *Allium Scorodoprasum* occurs there in great plenty, and is not recorded by Smith; it is possible this latter plant was intended.

67. *Mercurialis annua.* "Shore near Beal Castle, plentifully." Not there now, and no recent record.

1. *Pinus sylvestris.* Dr. Smith states that a few small shrubs still grew among the rocks in mountainous parts of Kerry in 1756. It is not known in a wild state anywhere in Ireland.

6. *Cryptogramma crispa.* "On the rocks among most of the southern baronies." Some error.

Dr. Wade, in his *Plantæ Rariores*, 1804, records *Juncus trifidus* from the base of Mangerton, a plant not known to occur in Ireland.

To turn now to more recent records:—

Arabis ciliata. Sandbanks near Darrynane, *Drummond;* and Trabeg, near Dingle, *H. C. Hart.* More probably a smooth form of *A. sagittata* was gathered.

Viola stagnina. Gap of Dunloe, *Rev. W. M. Hind.* No subsequent confirmation.

Saxifraga aizoides. Common Hill Cliffs, near Dingle, *J. T. Mackay, Cat.* 1806; and *Flora Hibernica.* No recent observation.

S. Andrewsii. Head of Glen Caragh, *W. Andrews.* The specimens shown were afterwards found to be garden hybrids.

Pulicaria vulgaris. Recorded by R. M. Barrington as found in Mr. Reilly's herbarium, labelled "Cromane, Co. Kerry." This plant has not been rediscovered, nor is it yet known elsewhere in Ireland.

Hieracium pallidum. Kenmare (*Dr. Taylor*), *C. C. B.;* Killarney, *Backhouse* and *Rev. E. F. Linton.* All my Kerry specimens gathered as *H. pallidum* prove to be *H. iricum* or *H. anglicum.*

Atropa Belladonna. Near Lord Ventry's residence near Dingle, *Rev. W. M. Hind.* Is it still there? Garden outcast.

Verbascum virgatum. On the College grounds at West Green Lane, near Kenmare, *Mackay.* No doubt introduced.

Salix nigricans. Near Dunkerron, *Dr. Taylor.* Some error.

Alisma natans. Ditches near Upper Lake, Killarney, *D. M.;* Middle and Lower Lakes, Killarney, *Rev. E. F. Linton.* Neither my friend Mr. A. G. More nor I have ever seen this plant in Kerry, nor do we know of any satisfactory Irish locality.

Carex axillaris, Near Upper Lake, Killarney, *Herb. Mackay.* Not recently observed.

Adiantum Capillus-Veneris. Recorded by Mr. W. Andrews as occurring on the Cahir-Couree range between Tralee and Dingle, at a "considerable elevation." I hope shortly to obtain some information concerning this station.

Polypodium Dryopteris. Torc Mountain and Muckross, Killarney. Several old records, but it is almost certain *P. polypodioides* was mistaken for it.

The following plants, though occurring in one or more localities in the neighbouring county of Cork, and likely enough to be found in Kerry also, have not yet come under my notice; and I would be much obliged if any botanist who has met with them in the county would kindly send me information concerning the localities:—

Ranunculus circinatus; *R. auricomus*. The latter very rare in the west of Ireland.

Papaver Argemone; *P. hybridum*. Both very rare, and colonists in Cork.

Helianthemum guttatum. Occurs on the coast both north and south of Kerry.

Geranium columbinum. A rare plant in Ireland, often introduced.

Trifolium arvense. Likely to occur on some of the sea-cliffs.—*T. scabrum*. One locality only in Co. Cork.

Vicia tetrasperma. Several localities in Cork.

Poterium Sanguisorba. Probably introduced in Cork.

Myriophyllum verticillatum. A rare plant in Ireland.

Lepigonum rubrum. One of the rarest Irish plants.

Scleranthus annuus. Very local, and probably a colonist in many places.

Œnanthe fistulosa; *Œ. Phellandrium*. Both are local in Ireland.

Anthemis arvensis. *A. Cotula* is often mistaken for it.

Senecio squalidus. *Vide* Journ. Bot. April, 1890, p. 114.

Carlina vulgaris. Apparently rare in the south-west.

Centaurea Scabiosa. Not rare in Cork.

Carduus nutans. Probably extinct, and never native, in Cork.

Cichorium Intybus. The Rev. Abraham Isaacs tells me this plant once grew in a field near Castlegregory, but it has not been recently seen in the county.

Crepis biennis. Found in Limerick, just outside the Kerry boundary.

Tragopogon pratensis. Very rare in Cork; perhaps extinct.

Helminthia echioides. Very rare, and a doubtful native in Cork.

Hieracium gothicum. Near Bantry, Cork; a plant doubtfully determined.

Gentiana Amarella. *G. campestris* occurs in several Kerry localities.

Cynoglossum officinale. Not yet noticed on any of the numerous Kerry sandhills.

Lithospermum officinale; *L. arvense*. Both are local in Co. Cork.

Orobanche Rapum. Rare everywhere in Ireland.

Verbascum Blattaria. Introduced in Cork.

Antirrhinum Orontium. Another introduction.

Linaria Elatina; *L. repens*; *L. vulgaris*.

Salvia Verbenaca. Recorded from Cork and Limerick.

Ballota nigra. Probably introduced in Cork.

Chenopodium murale. Very rare in Cork.

Rumex maritimus. Very rare in Ireland.

Euphorbia amygdaloides: *E. exigua*. The former one of the rarest of Irish plants.

Salix triandra; S. ambigua.

Stratiotes aloides. Introduced near Cork.

Elodea canadensis. Though this plant has spread almost like a plague over Ireland, it does not appear to have penetrated to Kerry, though several Cork and Limerick localities are known for it.

Ophrys apifera. A rare plant in Ireland, and one easily overlooked.

Spiranthes Romanzoviana. One of its known Cork stations is close to the Kerry boundary.

Allium vineale. Occurs in both Cork aud Limerick.

Juncus acutus. Very rare in Cork.

Butomus umbellatus. Should occur near the Shannon.

Potamogeton plantagineus; P. gramineus. Recorded in Allin's *Flora of Cork.*

Scirpus sylvaticus. Local in Cork.

Carex Pseudo-cyperus. Rather rare in Cork.

Glyceria distans. Appears a rare plant in Ireland.

Bromus secalinus; B. commutatus. Both probably introduced in Cork.

Agropyron caninum. Probably overlooked in Kerry.

Hordeum pratense. No *Hordeum* is known in Kerry.

Should any reader of this Journal meet with any of the above, I hope they will kindly communicate the fact to its pages. I shall gladly receive information concerning new localities for any of the rarer Kerry plants: address, 91, Lower Baggot Street, Dublin.

THE MOSS-FLORA OF THE DOWARD HILLS.*

By the Rev. Augustin Ley, M.A.

The Doward Hills, to the Flora of which the following paper is a contribution, constitute a small tract of land well known, at least among local botanists, for the richness of their vegetation. They have been scrutinised, now for half a century, by men so well known for accuracy of knowledge and quickness of eye, as Prof. C. C. Babington, the Rev. W. H. Purchas, and Alfred W. Bennett, M.A., as well as many others of less wide reputation, but great perseverance and careful research. Notably, Mr. B. M. Watkins has examined them for a long term of years; and the result of his and others' work has been that more than half of the total number of species native or well established in the county of Hereford are known to inhabit this small tract of under four square miles in extent. These results were brought before the public in a paper read by Mr. B. M. Watkins before the Woolhope Club in 1881; the

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* Extracted from a paper read before the Woolhope Naturalists' Field Club on October 2nd, 1890.

upshot being that, together with a few since observed, the total number of species of flowering plants and fern-allies (reckoning on the lines of the *London Catalogue of British Plants*, ed. 7, and exclusive of varieties) recorded for the Dowards is 626; fourteen of them being confined, so far as Herefordshire is concerned, to these hills.

Rich as this little tract is thus proved to be in phanerogamic vegetation, it appears to be no less so in the smaller group of true mosses here dealt with. These have not been studied by so many observers, nor for so long a term of years, as the flowering plants; yet the proportion of mosses known to inhabit the Doward Hills is already rather more than three-fifths of those recorded for the whole of Herefordshire; and this in a county which has been very fairly worked over nearly its whole area in this group of plants, and which possesses a decidedly rich moss-flora. It must be remembered, moreover, that while the flowering plants of every county contain many species whose citizenship is uncertain, the whole of the moss-flora is undoubtedly native; such an occurrence as the introduction of an exotic species by human agency being well-nigh unrecorded. A still more remarkable result comes out when a comparison is made with the totals of British mosses; 191 out of 568—or somewhat over one-third of the total moss vegetation of the British Isles—being present on the Dowards. This one-third includes several rare or very rare species, one having not been hitherto detected elsewhere in Britain. The present writer, in the course of a winter day's ramble in 1884, saw upon the Greater Doward alone 120 species, or somewhat more than one-fifth of the total number of species known to inhabit Britain.

The area comprised in the following list admits of being simply and well defined; being bounded on the N. by the line of the Ross and Monmouth turnpike-road, from the village of Whitchurch to the private gas-works of the Wyaston Leys establishment; and to the E., S., and W. by the tortuous course of the River Wye, which here also forms the county boundary. The space contained within these boundaries comprises about 2126 acres of singularly varied surface. A narrow rim of cultivated ground fringes the N.W.; S. and E., a still narrower rim of alluvial meadow, disappearing altogether in many places, runs along the river. The kernel of this thin shell is a mass of hill with a shallow soil, resting for more than half its area upon mountain limestone, and forming two heads with a slight depression between them, which are called respectively the Great and the Little Dowards, from the fact that the area of the greater is between two and two and a half times that of the lesser hill. The Little Doward is the higher, rising to about 450 ft. above the river-bed, and crowned on its summit by a large British camp. The whole of the Lesser Doward Hill is comprised in the Wyaston Leys estate, and has been converted into a deer-park by the family of the present owner, J. M. Bannerman, Esq. It was at one time the richest of the two in botany; but the effect of its conversion into a deer-park has been to destroy most of the rarer plants, with the exception of *Atropa Belladonna* L., of

which the steep limestone slopes of the Little Doward are in some seasons a teeming thicket.

About one-fourth of the Great Doward, on the N.E. face, is occupied by cottages and small half-tilled enclosures; two-thirds of the remainder consist of untouched primitive wood-land, which forms a large tract known as the Lord's Wood, which is now Crown property. More than half of both hills consists of mountain limestone, breaking into cliffs and peaks from 30 to 100 ft. high on the S. and E. faces above the river, which dominate steep and densely wooded slopes. In the centre of the mountain limestone, on the greater hill, lies a tract of conglomerate and sandstone detritus, covering many acres. Along the N. runs a band of conglomerate rocks, and outside them, but still within the area, a narrow fringe of cultivated ground, lying upon the Old Red Sandstone.

The sequence and nomenclature of species in the following list is taken from the *Flora of Herefordshire*. I am responsible for the records, unless otherwise stated. Most, if not all, of the more difficult species have been seen by Mr. H. Boswell, whose unwearied help and kindness it is desired here to acknowledge. The ! inserted after the name of a contributor indicates that a *dried* specimen of the plant from this station has been seen. Two !! indicate that a specimen has been seen in the *fresh* state. Three !!! indicate that the plant has been seen *growing*.

Pleuridium nitidum Hedw. Frequent on the river-bank from the Upper Ferry to the Gas-works, Wyaston Leys.—*P. subulatum* L. On the ground in the Lord's Wood.

Systegium crispum Hedw. A single tuft, by a wood-path, Lord's Wood, near the Great Quarry, 1877. Not again found.

Gymnostomum calcareum Nees. Shady calcareous and tufaceous rocks, at several stations on the east side of the hill. Fruit not found. The locality given for *Gyroweissia tenuis* Schrad., on "tufaceous rock, Great Doward," in the *Herefordshire Flora*, p. 369, must be altered to the present species. *G. tenuis* is, so far as known, confined to *sandstone* in Herefordshire.

Weissia microstoma Hedw. On the limestone, rare. Ditch-side at the bog, *B. M. Watkins* !!! In the Great Quarry. — *W. viridula* Brid. Abundant on banks, both in exposed and wooded situations. —Var. *densifolia* Wils. On exposed limestone at Arthur's Cave. — *W. mucronata* Bruch. Wooded bank; once only found. In the Lord's Wood, above the keeper's lodge.

Dicranoweissia cirrhata Hedw. Surprisingly rare. On conglomerate in the Lord's Wood; once only found. Not seen on decaying posts or thatch.

Cynodontium Bruntoni B. & S. Fine and plentiful on the conglomerate near the Old School. Abundant on the corresponding formation of Huntsham and Coppet Hills.

Dichodontium pellucidum L. On the river-bank at several stations, but poor and barren.

Dicranella Schreberi Hedw. Once only found. Lane-bank on the N.E. flank of the hill; barren. — *D. varia* Hedw. On loose

earth at the Mine Cave. Probably elsewhere.—[*D. rufescens* Turn. will probably be found.] — *D. heteromalla* Hedw. Frequent on the sandstone and conglomerate, where there is some shade.

Dicranum fuscescens Turn. At one station on the exposed conglomerate near the Old School; very fine, but barren.—*D. scoparium* Hedw. On tree-boles; and on the sandstone and conglomerate rocks; rarer on the limestone. — *D. majus* Turn. In the Lord's Wood, sandstone tract; also on lane-sides: the fruit not seen. Not on limestone?

Campylopus flexuosus Brid. Sandstone tract in the Lord's Wood; in fruit.—Var. *paradoxus*. On the side of a wood-path in the sandstone tract, Lord's Wood. — *C. fragilis* B. & S. On sandstone in the Lord's Wood; also on conglomerate rocks on the north face of the hill. Barren. — *C. torfaceus* B. & S. On the ground in the sandstone tract, Lord's Wood; abundant, and fruiting freely. All the *Campylopi* are absent from the limestone.

Leucobryum glaucum L. Conglomerate rocks near the Old School, and in the sandstone tract, Lord's Wood; fine, but barren.

Ceratodon purpureus L. On old charcoal floors in the woods, and on conglomerate rocks; elsewhere rare.

Seligeria Doniana Sm. Shady rocks, very rare. On shady lime-rocks at the Mine Cave, 1890, in minute quantity. First record for the county.—*S. pusilla* Hedw. Shady limestone, very rare. On the east face of Little Doward. First record for the county. — [*S. recurvata* Hedw. may occur on the conglomerate.]

Fissidens viridulus Wils. In Arthur's Caves, fruiting freely in 1888. It will doubtless be also detected on lane-hedgebanks.—[*F. exilis* Hedw. will probably be found.] —Var. *fontanus*. — *F. crassipes* Bry. Brit. On stones in the Wye, at the New Weir, and above the Fish-house. Mill-sluice, Whitchurch.—*F. incurvus* Schwg. Woods, on the ground; rare. In the Lord's Wood, near the Great Quarry. —*F. pusillus* Wils. Shady limestone. In the Mine Caves, &c., 1890. —*F. bryoides* Hedw. Lane-hedgebanks, abundant.—*F. adiantoides* Hedw. In the bog; fine, and fruiting freely. Not elsewhere.—*F. decipiens* De Not. Abundant on all the limestone rocks, both in shade and exposure; the fruit rather abundant. — *F. taxifolius* L. Abundant, on all soils. A large form, equalling *F. decipiens* in size, occurs in the mud of the river-bank.

Phascum muticum Schrad. The single specimen of this rare moss found on the Doward was communicated to us by Mr. B. M. Watkins! — [*P. serratum* Schreb. will probably be found.] — *P. cuspidatum* Schreb. Tillage fields, in winter; abundant. — [*P. curvicollum* Hedw. and *P. rectum* Sm. should be looked for.]

Pottia minutula B. & S. Tillage field at the summit of the Great Doward, abundantly.—*P. truncata* L. In tillage fields, and on the loamy river-bank, common. — [*P. intermedia* Turn. and *P. Starkeana* Hedw. will probably be found.] — *P. lanceolata* Dicks. Not common on these hills. Tillage field, along with *P. minutula*.

Eucladium verticillatum L. Limestone caves, at several spots, barren. Abundant and fruiting at the Dropping Well.

Leptotrichum flexicaule Hampe. Abundant on the limestone

débris and open limestone ground. — [*L. homomallum* Hedw. should occur.] —Var. *densum*. Rare. One tuft, 1890, on bare limestone at the Seven Sisters Rocks. First record for the county.

Trichostomum rubellum C. Müll. Very abundant, especially on the limestone. — *T. luridum* Hornsch. In the Great Quarry, fruiting, 1877. Larger and barren by the river. — *T. crispulum* Bruch. On the limestone of both hills, abundant throughout, and fruiting with some freedom.—*T. mutabile* Bruch. On the limestone, with a similar distribution to the last, but less abundant, and less often in fruit. — *T. tophaceum* Brid. Damp crevices in quarries, rare. In the Great Quarry, *Waterfall*! A large barren form also occurs in the river-mud. — *T. nitidum* Lindb. Rare. On exposed limestone, both of the Great and Little Dowards.

Tortula ambigua B. & S. On limestone banks and open ground. —*T. aloides* Koch. As the last; common. — *T. unguiculata* Hedw. Everywhere abundant. — *T. fallax* Hedw. In the quarries, on limestone. — Var. *brevifolia*. Limestone, not common. Near the river, in the Lord's Wood. — *T. recurvifolia* Schpr. In dry lime-stone quarries, rare. At one spot in the Great Quarry; first found in 1874. In a small quarry on the west side of the hill, 1890. Barren at both stations. — *T. cylindrica* Tayl. Scattered, on the limestone; poor and barren. — *T. vinealis* Brid. Rare. Small quarry on the N.W. side of the hills, 1890. — *T. rigidula* Dicks. Very abundant upon the limestone, especially in quarries: fruit not seen. — *T. spadicea* Mitt. At one station, but very rare. At the Dropping Well, *Watkins* !!!—*T. Hornschuchiana* Schultz. Wall-top at the Quarry, on the limestone; rare.— *T. revoluta* Schw. Wall-top (limestone) above the Great Quarry; abundant, but barren.— *T. convoluta* Hedw. Abundant on wall-tops.—Var. *sardoa*. Wall-top (limestone) near the Lower Ferry, 1890. First record in Herefordshire.—*T. sinuosa* Lindb. Muddy stone by the river-bank. Rock (limestone) at the bog. Rare.—*T. tortuosa* L. Very abundant on the limestone, both in shade and exposure: the fruit not rare in shade. — *T. subulata* L. Scattered, both on the limestone and sandstone. The large river-side form occurs near the Fish-house. — *T. muralis* L. Very common, both on walls and on the lime-stone rocks.—Var. *rupestris*. Abundant on the vertical faces of the limestone, in quarries.— *T. marginata* B. & S. Tufaceous rocks at the Dropping Well, abundant at one station.—*T. Vahliana* Schultz. Very rare. On an ant-hill near the summit of the Great Doward, 1890. First record for Herefordshire.—*T. latifolia* B. & S. On dry lime-stone in the Great Quarry! Absent or rare on the river-side stumps. —*T. lævipila* Brid. On elm stumps, common.—*T. intermedia* Brid. Abundant on the exposed limestone. Fruiting on the Seven Sisters Rocks.—*T. ruralis* L. On exposed limestone at three stations, but much less abundant than the last. On a roof at Whitchurch Mill. —*T. papillosa* Wils. Rare. On an elm at the Dropping Well.

Cinclidotus fontinaloides Beauv. In the river, near the keeper's lodge.

Grimmia apocarpa L. Abundant everywhere, both on sandstone and limestone. — Var. *rivularis*. Stones by the Wye at New Weir.

—[The variety *gracilis* should be found on shady limestone.]—*G. orbicularis* B. & S. On exposed limestone, rare. Limestone at the Seven Sisters, 1877 and 1890. Quarry on the N.W. of the hill, 1889.—*G. pulvinata* Dill. Everywhere abundant.—*G. trichophylla* Grev. On the conglomerate, both of the Great and Little Dowards; fruiting at both stations.—*G. montana* B. & S. Exposed limestone at the Seven Sisters Rocks. Conglomerate on the west face of Little Doward, 1890.

Racomitrium heterostichum Hedw. Mixed with *Grimmia trichophylla* on the conglomerate at the Old School. — *R. alopecurum* B. & S. Conglomerate rocks near the Old School, fine and fruiting, 1890.—*R. fasciculare* Schrad. Rare. On shady conglomerate rocks near the Old School.

Ptychomitrium polyphyllum Dicks. Upon limestone and sandstone walls; rare. Above the Great Quarry; and near the Old School.

[*Amphoridium Mougeotii* should be found on the conglomerate rocks.]

Zygodon viridissimus Dicks. On elm- and ash-boles near the Dropping Well. Fruiting on an elm in 1884.—Var. *rupestris*. On limestone, rare. In fruit near the Dropping Well. — *Z. Stirtoni* Schimp. Shady limestone on the east face of Great Doward; rare, *Rev. C. H. Binstead* !!! First record for the county.

Ulota crispa Hedw. On a beech at the Mine Cave, 1887, and each year subsequently. The only station in the county.

Orthotrichum saxatile Brid. At one station only. Limestone point at the bog. — *O. cupulatum* Hoffm. Rare. On limestone points near the Great Quarry. — Var. *nudum*. Wall at the New Weir, near the river. — *O. stramineum* Hornsch. Elm-bole at the Dropping Well, abundantly. Not noticed elsewhere. — *O. tenellum* Bruch. Elm-boles, with the last, but less abundant. — *O. affine* Schrad. On tree-boles; not abundant on the Dowards. — *O. diaphanum* Schrad. On tree-boles; abundant. — *O. Lyellii* H. & T. Tree-boles, not uncommon. The fruit has not been observed.—*O. Sprucei* Mont. Willow-boles below the New Weir, in fair plenty.—*O. rivulare* Turn. River-side roots and stumps, above the Fish-house, abundantly.

Encalypta vulgaris Hedw. On exposed limestone ledges, in the quarries; in the same situations, and often growing with the next species. Noticed at several stations. — *E. streptocarpa* Hedw. On exposed limestone, especially in deserted quarries, abundantly. Fruiting abundantly in an old quarry on the N.W. side of the hill, 1884 and 1885.

Physcomitrium pyriforme L. On the damp loam of the vertical river-bank, rare. Between the two Ferries.

Entosthodon ericetorum Bals. Confined to the sandstone tract in the Lord's Wood. Bank in the sandstone tract, first discovered by Mr. Watkins !!! in 1873, and noticed at the same station in many subsequent years. Abundantly in a second station, in an old cart-way, 1890. The above still continue the only stations known for this moss in Herefordshire.

Funaria fascicularis Dicks. Cultivated ground. In tillage fields near Whitchurch. — *F. calcarea* Wahl. Thin earth on exposed limestone, confined to a single station. Rocks at the S.E. point of the Little Doward, 1877, and again in 1890. — *F. hygrometrica* L. Common. Abundant on disused charcoal floors in the woods.

[*Bartramia pomiformis* L. will probably be found on the conglomerate of the northern exposure.]

Philonotis fontana L. On the river-bank; rare, and in small barren bits. Great Doward; Little Doward.

Bryum pyriforme L. Shady rocks, rare. In Arthur's Cave, 1873 and 1874, fruiting. Shady wall near the Lower Ferry, 1890, barren. Both these stations are on limestone.— *B. nutans* Schreb. On conglomerate sand in the sandstone tract in the Lord's Wood, along with *Campylopus torfaceus* B. & S. Not seen elsewhere.— *B. carneum* L. Moist vertical loam of the river-bank, abundantly. Moist bank at the Mine Caves.— *B. albicans* Wahl. With the last, on the river-bank; abundant, but always barren. A large form on the shady river-bank above the Fish-house.— [*B. pendulum* Hornsch. should be looked for on the river-bank.] — *B. inclinatum* Swartz. Wall-tops; rare? Wall-top at the Lower Ferry, 1890. Specimens from one or two other localites on the Doward, gathered by Miss E. Armitage! — *B. Barnesi* Wood. Muddy stones on the river-bank; very rare. Near the Upper Ferry.—[*B. intermedium* W. & M. was reported by Mr. Watkins from a wall at Wyaston Leys, but proved to be a state of *B. capillare* L.] — *B. bimum* Schreb. At the bog, along with *B. pseudotriquetrum*. Steep river-bank above the Fish-house. Barren at both stations.—*B. torquescens* B. & S. On horizontal ledges in disused lime-quarries, at several stations, but not abundant. — *B. atropurpureum* W. & N. On the ground, especially at old charcoal floors in the woods. Great Doward and Little Doward. — *B. versicolor* Braun. At a single station on the shady river-bank above the Fish-house; fruiting in 1887, barren, 1888.—*B. cæspiticium* L. Wall-tops, abundant. —Var. *imbricatum*. In dry turf on the Little Doward, barren, 1873. — *B. argenteum* L. Common. Abundant on the charcoal floors in the woods. — *B. capillare* L. Wall-tops; rocks of sand and limestone; stumps, &c.; very common. — *B. Donianum* Grev. Rare. In large barren tufts by the river-side, within the influence of the winter floods. Great Doward, above the Fish-house.— *B. provinciale* Phil. Shady limestone ledges, confined to a very small area in the Lord's Wood. Fruiting in small quantity in several seasons. — *B. pallens* Swartz. On the limestone, at several places in the Great Quarry, but always small and barren. — *B. turbinatum* Hedw. Muddy stones by the river-bank; very rare. River-bank near the Dropping Well; small and barren. — *B. pseudotriquetrum* Hedw. Abundant at the bog, and fruiting freely. — *B. roseum* Schreb. Shady woods, very rare. At one station beneath the cliffs on the east side of Lord's Wood.

Mnium cuspidatum Hedw. Shady river-bank in the Lord's Wood; abundant, and fruiting freely. — [*M. affine* Bland, recorded in *Fl. Herefordsh.* p. 412, from the river-bank, will probably prove to be *M. cuspidatum* Hedw.] —*M. undulatum* Hedw. Abundant wherever

any shade is found. Fruiting on a few occasions in the dense shade of the east flank of Lord's Wood. — *M. rostratum* Schrad. Shady parts of Lord's Wood, on fallen limestone blocks, &c. Fruiting, along with the last, but shyly. — *M. hornum* L. Very abundant in the woods, especially on the sandstone and conglomerate, and fruiting freely.—*M. serratum* Schrad. On roots and stumps on the shady river-bank. Abundant above the Fish-house, and fruiting freely. — *M. stellare* Hedw. Shady stones and lane-banks, on the sandstone; I believe also on the limestone. — *M. punctatum* Hedw. On shady rocks in the Lord's Wood; also abundantly on the shady river-bank; fruiting occasionally.

Tetraphis pellucida L. Sandstone rocks in the Lord's Wood; the fruit not yet detected.

Atrichum undulatum L. Abundant on the ground, especially in woods. — Var. *minus*. On the ground in the Lord's Wood, 1890. First record for Herefordshire.

Pogonatum aloides Hedw. Bare vertical banks, both on sand and limestone, common. Abundant in old cart-tracks in the Lord's Wood. — [*P. nanum* Neck. ought to be found on the sandstone or conglomerate, but has been repeatedly sought in vain.]

Polytrichum formosum Hedw. Abundant throughout the woods, especially on the sandstone. — *P. juniperinum* Hedw. Wooded bank, Little Doward. On conglomerate boulders in open situations on both hills.—*P. piliferum* Schreb. Conglomerate rocks and turf wall-tops on the sandstone. Great Doward.

[*Diphyscium foliosum* should be looked for.]

Fontinalis antipyretica L. In the river, near the keeper's lodge.

Hedwigia ciliata Dicks. Conglomerate rocks, not common. Exposed conglomerate on the west face of the Little Doward.

[*Cryphæa heteromalla* Hedw. should be searched for on elm-boles.]

Leucodon sciuroides L. Tree-boles, abundant.

Neckera crispa L. Abundant, and often very fine, on the shady limestone. Fruiting freely at the Great Quarry and elsewhere. — *N. complanata* L. On tree-stumps and rocks. Not abundant, and the fruit not found.

Homalia trichomanoides Schreb. Tree-boles by the river, at the New Weir, fruiting.

Leskea polycarpa Ehrh. Stumps and roots within the influence of the river-mud, abundantly.

Anomodon viticulosus L. On the shady limestone, in great abundance; the fruit also abundant.

Thuidium tamariscinum Hedw. Abundant in the woods. Fruit not observed.

Pterogonium gracile Dill. Exposed conglomerate rocks on the Little Doward; barren.

Climacium dendroides L. One station only, in small quantity. Marsh below the Dropping Well.

Thamnium alopecurum L. Shady rocks, especially on the limestone. The fruit occasional.

Isothecium myurum Poll. Shady rocks and banks. In fruit?— Var. *robustum*. Shady limestone on the Little Doward.

Orthothecium intricatum Hartm. Damp cavernous limestone, rare. At two stations at Arthur's Caves.

Homalothecium sericeum L. Fine and abundant on the limestone; the fruit also abundant.

Camptothecium lutescens Huds. Open grassy limestone banks, abundant. Several times found in fruit.

Scleropodium cæspitosum Wils. Muddy river-side rocks, rare. Rocks at the Little Doward, sparingly. — [*S. illecebrum* Schwg. should be searched for on marly banks, under trees. Looked for hitherto in vain.]

Brachythecium glareosum B. & S. Open grassy banks, both on sand and limestone; the fruit not detected.— *B. velutinum* L. On elm-boles, abundant.— *B. rutabulum* L. Ubiquitous.— *B. rivulare* B. & S. On the river-bank above the Fish-house, abundantly.— *B. populeum* Hedw. On stones in dense shady woods, not rare. In the Lord's Wood, near Arthur's Caves, &c. — *B. plumosum* Swartz. Very rare. On a conglomerate rock near the Old School, fruiting, 1887, 1890.

Eurhynchium myosuroides L. On the sandstone and conglomerate rocks; abundant and fruiting. — *E. circinatum* Brid. Shady limestone, rare. East face of the Great Doward, in two spots. East face of the Little Doward, abundantly, 1890.—*E. striatulum* Spruce. Shady limestone, locally abundant. On the east face of the Great Doward. Fruiting on the south face of the Great Doward, below the Seven Sisters.—*E. striatum* Schreb. Hedge-banks, &c., on the sand and limestone, abundant.—*E. crassinervium* Tayl. Abundant throughout the limestone; the fruit rather rare. — *E. piliferum* Schreb. Wood-paths in the Lord's Wood; rare, and the fruit not found. — *E. Swartzii* Turn. Sandstone and limestone banks; abundant, but always barren.— Var. *atrovirens*. Limestone, under dense shade, on the east face of the Great Doward.—*E. abbreviatum* Sch., Syn. Lane hedge-banks, on the sandstone. Shady stone on limestone near the Mine Caves.—*E. prælongum* Dill. Very common everywhere. — *E. pumilum* Wils. Hedge-banks on the sandstone; rare.—*E. Teesdalei* Sm. At one station. Mill-sluice, Whitchurch.

Rhynchostegium tenellum Dicks. Very abundant on the shady limestone; the fruit abundant.—*R. depressum* Bruch. Shady limestone, and at the base of limestone walls, at many spots on the Great Doward. Shady limestone on the east face of Little Doward. —*R. confertum* Dicks. Scattered, on shady stones, common. — *R. murale* Hedw. Stones and walls on the limestone, not abundant. On the east face of Great Doward.— [Var. *julaceum* should be found on stones in the river-mud.] — *R. ruscifolium* Neck. In water, and under the drip of roofs, common. Whitchurch Mill. In the Wye.

Plagiothecium Borrerianum Spruce. Shady sandstone near the Old School. Only known in one station. — *P. denticulatum* L. Common, especially on the sandstone, and in lane-hedges. — Var. *aptychus*. On conglomerate below the Old School. — [*P. sylvaticum* L. will probably be found, on search. — *P. undulatum* L. seems to be absent, or very rare.]

Amblystegium serpens L. Abundant everywhere. Forms growing upon shady limestone exhibit remarkable variation from the type, and merit further investigation. — *A. radicale* P. Beauv. In the stream issuing from the bog; very rare. — *A. fluviatile* Swartz. With the last; also very rare. — *A. riparium* L. Stones by the Wye, at the New Weir; fruiting freely.

Hypnum Somerfelti Myrin. Very abundant all over the limestone area, and fruiting abundantly.—*H. chrysophyllum* Brid. Rare. Shady limestone on the south face of the hill, barren.—*H. stellatum* Schreb. On the limestone, both in dry and damp situations; the fruit not abundant.—Var. *protensum*. Abundant at the bog: fruiting in 1888. — *H. filicinum* L. Wet spots; also in dry shade on limestone; abundant, but the fruit rare. — *H. commutatum* Hedw. Abundant, and fruiting at the Dropping Well; not noted elsewhere. — *H. virescens* Boulay. With the last, in the bog above the Dropping Well. Once found fruiting. — *H. rugosum* Ehrh. Very rare. At one station near the Seven Sisters; poor, and apparently in decreasing quantity, 1872, and subsequent years. — *H. cupressiforme* Dill. Very abundant, in many types of situation. — Var. *filiforme*. Common on tree-boles.—Var. *lacunosum*. On the ground in the Lord's Wood? — Var. *resupinatum*. On tree-stumps and rocks. — *H. patientiæ* Lindb. Abundant in several parts of the Lord's Wood, in wood-paths on clay soil. First noticed by Mr. Watkins. — *H. molluscum* Hedw. Limestone, especially where exposed. Abundant, and fruiting freely. — *H. palustre* L. At the Mill-sluice, Whitchurch; fine and fruiting. In small scraps on the river-side stones at several places.—*H. cuspidatum* L. In damp or boggy grass, abundant. Fruiting in the Large Quarry, *Miss E. Armitage*!—*H. Schreberi* Ehrh. Open grassy banks and woods, on sandstone and conglomerate, common.—*H. purum* L. Everywhere, in turf. Fruit (rare) in limestone banks on the west face of the hill. — *H. splendens* Dill. Woods and open bushy hills. Not abundant, and the fruit not seen. — *H. squarrosum* L. In turf, abundant in open or bushy situations; the fruit not observed.—[*H. loreum* L. seems to be absent, or very rare.]—*H. triquetrum* L. In woods, both on sandstone and limestone; also in open limestone ground, and grassy hills. The fruit not observed.

Sphagnum cuspidatum Ehrh. Very rare. In a damp depression in Lord's Wood, on sandstone, 1890.

On analysing the above list, the following 25 species are either confined to, or show a marked preference for, limestone:—

Gymnostomum calcareum.
Weissia microstoma.
Seligeria pusilla.
Fissidens decipiens.
Eucladium verticillatum.
Leptotrichum flexicaule.
Trichostomum crispulum.
T. mutabile.
Tortula recurvifolia.
Tortula tortuosa.
Grimmia orbicularis.
Encalypta streptocarpa.
Neckera crispa.
Anomodon viticulosus.
Camptothecium lutescens.
Eurhynchium circinatum.
E. striatulum.
E. crassinervium.

Rhynchostegium tenellum.
R. depressum.
R. murale.
Hypnum Somerfelti.
Hypnum chrysophyllum.
H. rugosum.
H. molluscum.

The following 10 are related in a similar manner to the sandstone and conglomerate :—

Cynodontium Bruntoni.
Dicranum fuscescens.
Campylopus flexuosus.
C. fragilis.
C. torfaceus.
Leucobryum glaucum.
Grimmia trichophylla.
Hedwigia ciliata.
Pterogonium gracile.
Plagiothecium Borrerianum.

The following 6 species are lovers of the river-mud :—

Pleuridium nitidum.
Physcomitrium pyriforme.
Bryum carneum.
Bryum Barnesi.
B. turbinatum.
Leskea polycarpa.

The following 15 are immersed in, or confined to, the immediate vicinity of water :—

Dichodontium pellucidum.
Fissidens fontanus.
Tortula spadicea.
Cinclidotus fontinaloides.
Orthotrichum nudum.
O. rivulare.
Fontinalis antipyretica.
Brachythecium rivulare.
Eurhynchium Teesdalei.
Rhynchostegium ruscifolium.
Amblystegium radicale.
A. fluviatile.
Hypnum commutatum.
H. virescens.
H. palustre.

The following 14 species are *montane* in habit; that is, are rare in the lowlands, and become frequent in the highlands :—

Campylopus flexuosus.
C. torfaceus.
Leucobryum glaucum.
Grimmia trichophylla.
G. montana.
Ptycomitrium polyphyllum.
Entosthodon ericetorum.
Bryum nutans.
B. pallens.
B. pseudotriquetrum.
Hedwigia ciliata.
Pterogonium gracile.
Orthothecium intricatum.
Brachythecium plumosum.

The following 14 species are confined to the Doward Hills, so far as Herefordshire is concerned :—

Seligeria Doniana.
Tortula Vahliana.
Grimmia orbicularis.
Zygodon rupestris.
Ulota crispa.
Entosthodon ericetorum.
Bryum versicolor.
Bryum imbricatum.
B. provinciale.
Isothecium robustum.
Eurhynchium atrovirens.
E. striatulum.
Hypnum Somerfelti.
H. rugosum.

The following 10 are very rare in Herefordshire, and confined to one or two stations outside the Doward area :—

	Where else found.	*Station.*
Systegium crispum . . .	Hereford.	One.
Gymnostomum calcareum .	Backbury Hill.	One.
Weissia mucronata . . .	Welsh Newton.	One.
Cynodontium Bruntoni . .	Coppet Hill, &c.	Three.
Dicranum fuscescens . . .	Huntsham Hill.	One.
Phascum muticum . . .	Titley.	One.
Grimmia montana . . .	Golden Valley; Pont Esgob.	Two.
Zygodon Stirtoni	Huntsham; Ludford.	Two.
Funaria calcarea	Backbury Hill.	One.
Bryum torquescens . . .	Caplar; Downton.	Two.
B. turbinatum	Coppet Hill; Grwyne Valley.	Two.

ADDITIONAL NOTES ON S.W. SURREY RUBI.

By James W. White, F.L.S.

The paper published in this Journal for October by the Revs. W. M. Rogers and E. F. Linton may be supplemented by some notes made during the last three years in an unfrequented part of the county, situate on the Sussex border, a few miles east of the locality examined by the botanists named. My notes were made, for the most part, on a dry, elevated table-land; and this may account for the apparent absence of the whole of the *Suberecti*. On the other hand, there are included several species unnoticed in the paper above mentioned, which presumably have not been hitherto recorded in the county. These are distinguished by an asterisk. Several doubtful plants were submitted to Dr. Focke, who kindly gave an opinion.

Rubus Lindleianus Lees. Scarce. Hedge near Baynards Station. Green lane on the Sussex boundary of Ewhurst parish.

R. rhamnifolius W. & N. Seen only on the Cranleigh Road, near Ellen's Green.

**R. pubescens* W. & N. Just as in the adjacent portion of Sussex, a number of allied forms that Dr. Focke places under this variable aggregate are frequent in the parish of Ewhurst. Exceptionally good *pubescens* grows on Ellen's Farm, close to the Sussex boundary.

R. rusticanus Merc. Common.

R. leucostachys Sm. Pinkhurst Farm. Copse-hedge by Cock's Green. Scarce.

R. villicaulis Koehl. In several spots on Sansom's Farm.

R. umbrosus Angl. Well distributed in Ewhurst parish, and about Leith Hill.

**R. micans* Godr. & Gren. Open ground on a southern slope of Leith Hill.

R. macrophyllus W. & N. Seen only by the road-side between llen's Farm and Rowhook.

**R. Drejeri* Jens. In field-hedges on Sansom's Farm. Named by the Rev. W. M. Rogers.

R. Sprengelii Weihe. "The typical German plant," Dr. Focke. Only met with under Leith Hill.

R. Hystrix Weihe. Near the School at Ellen's Green. Pinkhurst. Leith Hill.

R. echinatus Lindley. In a green lane on the Sussex boundary, abundant. "It differs from the typical *R. echinatus* by the rarity and short stalks of the glands," Dr. Focke.

R. Koehleri Weihe. The ordinary forms were gathered near the Cranleigh Road, and at Pinkhurst. The variation which was found abundantly at Witley by Messrs. Rogers and Linton grows also in great quantity on the lower slopes of Leith Hill. It is an extremely pretty and distinct-looking plant, and may be worthy of a varietal name.

R. Radula Weihe. May Hill. Baynards. Sansom's Farm.

**R. fusco-ater* Weihe. In hedges on Ellen's Farm, Ewhurst parish; rather sparingly. Name given by Dr. Focke.

R. diversifolius Lindley. Very common in road-side hedges and elsewhere.

**R. Bellardi* Weihe. Plentiful in open copses on Sansom's Farm.

R. hirtus W. & N. Plants that may be considered typical *hirtus* are scarce in Surrey, as elsewhere. Several very elegant forms that differ from each other are placed here by Dr. Focke. One, especially handsome, occurs abundantly on Ellen's Farm.

R. Balfourianus Blox. Field-hedge on the Sussex border, near Rudgwick Church.

R. corylifolius Sm. Not common. Both *sublustris* and *conjungens* grow in field-hedges between Rowhook and Rudgwick, chiefly on high ground near the Sussex boundary.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 251.)

Whitehead, Rev. Edward (1799?–1827): b. Bolton, Lanc., 1799?; d. Eastham, Worcester, 4th June, 1827. M.A., Oxon, 1812. B.D., 1820. Rector, Eastham, Worcester, 1805. Discovered *Aconitum* as British, 1819. Fl. Herefordsh., 12.

Whitehead, John (fl. 1862). Of Dukinfield. Operative. Muscologist. Cott. Gard. xxviii. 585.

Whitfield, Thomas (fl. 1845). Collector for Lord Derby at Sierra Leone and in interior. Bot. Mag. 4155. *Whitfieldia* Hook.

Whitla, Francis (fl. 1830–46). Of Belfast. Knew Irish plants well. Distinguished *Equisetum trachyodon*. 'Fossil Equiseta,' Journ. Geol. Soc. Ireland, 1838, 79. Journ. Bot. 1846, 311 R. S. C. vi. 351. *Whitlavia* Harv.

Whittle, Peter A. (fl. 1789–1853): b. Inglewhite, Goosnargh, Lancashire, 9th July, 1789. Bookseller and printer. 'Flora Prestoniensis,' unpublished in 1837. Autobiog. in 'Hist. Preston,' ii. 336.

Widdrington, Samuel Edward (olim **Cook**) (d. 1856): d. 11th Jan. 1856. Captain R.N. Took name of Widdrington, 1840. In Spain, 1829–32, and in 1843. 'European Pines,' Ann. Nat. Hist. ii. 163; iii. 296; viii. 87. 'Vegetation of Spain,' Rep. Brit. Assoc. 1847, ii. 88. Michaud. *Widdringtonia* Endl.

Wigg, Lilly (1749–1828): b. Smallburgh, Norfolk, 25th Dec. 1749; d. Gt. Yarmouth, 28th March, 1828. Of Great Yarmouth. Shoemaker, schoolmaster, and bank-clerk. A.L.S., 1790. Instructed Dawson Turner in Algæ. "A most ingenious and accurate observer," Smith. MS. on Esculent Pl. in Bot. Dept., Mus. Brit., and 'Flora Cibaria' at Kew, which contains pencil portrait by Mrs. Dawson Turner, &c. Contrib. to E. Bot. (205, 419, 571, 847, 2247), and to Withering, ed. 2. Linn. Trans. vi. 126, 136; Gent. Mag. 1830, i.; Trans. Norf. Nat. Soc. ii. 269; Hind, Fl. Suffolk, 480. Portr. at Linn. Soc. and Kew. *Fucus Wigghii* Turn. = *Naccaria Wigghii*.

Wight, Robert (1796–1872): b. Mitton, Duncra Hill, E. Lothian, 6th July, 1796; d. Grazeley, nr. Reading, Berks, 26th May, 1872. M.D., Edinb., 1816. F.L.S., 1832. F.R.S., 1855. In India, 1819–53. Superintendent, Bot. Gard., Madras. 'Prodromus Fl. Peninsul. Orient.' (with Arnott), 1834. 'Illustrations of Indian Bot.,' 1838–40. Discovered *Carex Grahami*, 1832. Pritz. 346; Jacks. 620; R. S. C. vi. 364; Gard. Chron. 1872, 731; E. Bot. 2923; Journ. Bot. 1841, 156 (portr.); 1872, 223; Trans. Bot. Soc. Edinb. xi. 363 (portr. and bibliogr.). Photo. at Kew. Herbarium at Kew. *Wightia* Wall.

Wildgose, Robert (fl. 1820–30). Of Daventry. List of pl. in Baker's 'Hist. of Northants,' 1822–30.

Wilford, Charles (fl. 1857). Kew collector. In Formosa with Swinhoe in 1857–8 in H.M.S. 'Inflexible.' Fl. Hongkong. 11*. Plants at Kew. *Hemionitis Wilfordi* Hook.

Wilkin, Simon (1790–1862): b. Cossey, Norfolk, 27th July, 1790; d. Hampstead, 28th July, 1862. F.L.S., 1811. Friend of J. E. Smith. Had private bot. garden at Cossey. Sent *Conferva capillaris* to E. Bot. (2364). Proc. Linn. Soc. 1862–3, xlvi.

Wilkins, Miss (fl. 1847). Discovered *Simethis* at Bournemouth, 1847. Gard. Chron. 1847, 467.

Wilkinson, Caroline, Lady, *née* **Lucas** (1822–81): b. Llandebie, Caermarthen, 10th May, 1822; d. Llandovery, 2nd Oct. 1881; bur. Llandovery. Wife of following. 'Weeds and Wild Flowers,' 1858. Made drawings of fungi. Pritz. 347; Jacks. 215; Journ. Bot. 1882, 159.

Wilkinson, Sir John Gardner (1797–1875): b. Chelsea, Middlesex, 1797; d. Llandovery, 29th Oct. 1875; bur. Llandovery. D.C.L. Ox., 1852. F.R.S. Knighted, 1839. Egyptologist. Collected in Egypt, 1823–30, and made drawings. Plants in Hb. Brit. Mus. Journ. Bot. 1880, 224; 'Athenæum,' 1875, ii. 610.

Wilkinson, George (fl. 1803). Surgeon at Sunderland. 'Experiments on Cortex Salicis Latifoliæ,' 1803. Jacks. 205.

Williams, Charles (fl. 1828–35). Of Salisbury. 'The Vegetable World,' ed. 2, 1833. Pritz. 348; Jacks. 38.

Williams, Rev. Edward (1762?–1833): b. Eaton, Salop, 1762?; d. Chelsfield, Kent, 3rd Jan. 1833. M.A., Oxon, 1787. Incumbent of Battlefield and Uffington, Salop, 1786. Rector of Chelsfield, 1817. 'Shropshire Lichens,' Ann. Mag. Nat. Hist. i. 183 (1868). MS. Flora of Shropshire in possession of Lord Berwick. Had a herbarium. Discovered *Elatine hexandra* in Britain, Aug. 1798. Contrib. to E. Bot. (904, 955, 2360). Leighton, Fl. Shrops., pref. R. S. C. viii. 1243.

Williams, John (fl. 1830). Of Llanrwst. 'Faunula Grustensis: the natural contents of Llanrwst; also a cat. in Latin, English and Welsh, of the animals and plants,' 1830.

Williams, Joseph (fl. 1850). M.D. Lecturer on Bot., Dublin. Revised 3rd ed. of J. H. Balfour's 'Manual,' 1848. 'Botanists' Vade-Mecum,' 1855; ed. 2, 1856. Jacks. 217.

Williams, J. (fl. 1825). 'Dissert. de succi circuitu,' 1825. Pritz. 348.

Williamson, T. (fl. 1842). Private in 72nd Regt. Sent Natal plants to Harvey. Journ. Bot. 1842, 27.

Willisel or **Willisell, Thomas** (fl. 1640–86): b. Northants or Lancashire; d. Jamaica? before 1686. Collector for Merrett, Morison, Sherard, Ray, and the Royal Society. Had served under Cromwell. Travelled all over United Kingdom. Gardener at Jamaica. Plants in Hb. Sloane, 27. Pult. i. 347; Mus. Pet. n. 742; Weld, Hist. Roy. Soc. i. 224; Aubrey, Nat. Hist. Wilts. chap. ix.; Cash, 2.

Willshire, William Hughes (fl. 1839–79). M.D. Edinb. Memb. Bot. Soc. Lond. Lect. Bot., Charing Cross Hospital. 'Principles of Bot.,' 1840. Pritz. 348; Jacks. 39.

Willughby, Francis (1635–72); b. Middleton, Warwick, 1635; d. Middleton, 3rd July, 1672; bur. Middleton Church. B.A., Camb., 1656. M.A., 1659. F.R.S. Pupil and friend of Ray. Zoologist. Papers in Phil. Trans. iv.–v. Ray Mem. 13. 'Naturalists' Library,' vol. xvi., with portr. engr. Lizars from oil painting at Wollaton. Bust in Trin. Coll. Camb. *Willughbeia* Schreber.

Wilmer, Bradford (fl. 1781). Of Coventry. Surgeon. 'Observations on poisonous vegetables,' 1781. Pritz. 348; Jacks. 206.

Wilmer, "Dr." John (d. 1769): d. Westminster, Jan. 1769. Apothecary and physician, practising in Chelsea. Præfectus horti and demonstrator, Chelsea, 1748–64. Semple, 71, 74; Gorham, 7.

Wilson, Mrs. Lucy, *née* **Atkins, Sarah** (fl. 1822). Of Chipping Norton. m. Rev. Daniel Wilson. 'Botanical Rambles,' 1822. Friends' Books, i. 141.

Wilson, —. (fl. 1740). Tailor, of Norwich. Had a herbarium. Linn. Trans. vii. 296.

Wilson, Edward S. (fl. 1846). Of Buglawton, Cumberland.

'Cowslip and Primrose,' Phyt. ii. 1846, 377, 550. R. S. C. vi. 385.

Wilson, James Hewetson (1827?–1850): b. Chorlton, Manchester, 1827?; d. Worth, Sussex, 12th Nov. 1850. B.A., Oxon, 1850. F.L.S., 1847. Transl. Jussieu's 'Elements of Botany,' 1849. Proc. Linn. Soc. ii. 139.

(To be continued.)

SHORT NOTES.

Erythræa capitata Willd. var. sphærocephala Towns. in Dorset. — While botanising at Durlstone Head, near Swanage, early in May, with Messrs. Moyle Rogers and E. F. Linton, I noticed some plants of a small *Erythræa*, which might be either the above or *E. Centaurium* var. *capitata*. Cultivation has proved them to be exactly what is figured in the *Flora of Hants*, after this Journal. The locality is one in which it might well be expected to occur.—Edward S. Marshall.

Potamogeton lanceolatus in Ireland.—A few weeks ago, Mr. P. B. O'Kelly, of Ballyvaughan. sent me a few specimens of a small *Potamogeton*, which he had gathered in the Cahira River, south of Black Head, in the Burren district of Clare. These I showed to my friend, Mr. A. G. More, and we agreed that it must be referred to *P. lanceolatus* Smith, although this plant had hitherto been found only in North Wales and in the English Fens. On referring the specimens to Mr. Arthur Bennett, he quite confirmed this determination, and considers it to be a most interesting addition to the Flora of Ireland; for although recorded as occurring in the County Down, it is now believed that no reliance can be placed on Mr. Orr's specimens.—H. Levinge.

South Hants Plants.—Breamore Down is already noted as the one locality in Hampshire for *Carex humilis* Leysse. This sedge is so plentiful in the turf of Mizaze Hill, as the highest point is called, that I easily recognised it at the end of August last. In one of the less dense thickets, which are numerous on this chalk ridge, I discovered two bushes of *Rosa sepium* Thuill. fruiting well. These plants represented the usual type. I may mention here the occurrence of two or three brambles which I came across first in 1890, when out for a walk with the Rev. R. P. Murray, and have visited again this year, in the little valley down which the stream from Holmsley Bog flows towards Surrey. They are *Rubus fissus* Lindl., *R. rhombifolius* Weihe, and *R. althæifolius* Host. The latter I sent queried under this name to Prof. Babington, who returned it saying it was excellent *althæifolius*. This is given in the *Flora* as rare, and not occurring in District III. *R. rhombifolius* is new to the county, and was named for me by Dr. Focke at the same time that he named my Witley (Surrey) gathering of this same species; I had previously put them together as identical, without much doubt. *R. fissus* Lindl. is, I believe, also new to the county; it

was reported in *Journ. Bot.* 1889, p. 13, but the Rev. W. Moyle Rogers tells me that he withdraws his notice of it, and knows of no true *fissus* for the county, except this plant of mine. It is, as Dr. Focke says in his 'Notes on English Rubi,' a "northern form." I have gathered it once in Dorset, namely, near the Queen's Wood, Horton, and in this one spot in Hants.—Edward F. Linton.

Plants of the Flat Holme.—The last part (vol. xxii. pt. 2, 1891) of the *Transactions of the Cardiff Naturalists' Society* contains a list of the plants of the Flat Holme—an island adjoining the Steep Holmes, in the Bristol Channel. As the Flora of the last-named was partially recorded in this Journal for September, the list of Flat Holme plants given by Messrs. T. H. Thomas and John Storrie as the result of their investigations in June, 1890, may be useful for comparison. We have omitted certain cultivated plants from the enumeration, which otherwise stands as given by Messrs. Thomas and Storrie, and, of course, on their authority:—*Ranunculus repens. Fumaria capreolata, F. officinalis. Cochlearia officinalis, Capsella Bursa-pastoris. Polygala vulgaris. Silene maritima, S. inflata* var. *puberula, Stellaria media, Cerastium arvense.** *Linum catharticum. Malva sylvestris, Lavatera arborea* [one specimen: planted?]. *Hypericum perforatum, H. pulchrum. Geranium Robertianum, G. molle. Erodium hirsutum.*† *Rhamnus Frangula* (*R. catharticus*, given by Dr. Turton, not seen). *Trifolium repens, T. procumbens, T. pratense, Lotus corniculatus. Prunus communis, Poterium Sanguisorba, Agrimonia Eupatoria, Rubus cæsius, R. fruticosus, Potentilla reptans, Rosa rubiginosa, R. canina. Cotyledon Umbilicus, Sedum acre. Hedera Helix. Smyrnium Olusatrum, Daucus Carota, Fœniculum vulgare, Crithmum maritimum. Sambucus nigra. Galium Aparine, G. saxatile, G. verum. Centranthus ruber. Dipsacus sylvestris. Taraxacum officinale, Hieracium Pilosella, Tragopogon pratensis, Carlina vulgaris, Carduus acanthoides, Arctium Lappa, Senecio vulgaris, S. Jacobæa, Bellis perennis, Chrysanthemum Leucanthemum, Achillea Millefolium. Ligustrum vulgare. Erythræa Centaurium. Convolvulus arvensis. Solanum nigrum, Hyoscyamus niger. Veronica arvensis, V. Chamædrys, V. agrestis. Euphrasia officinalis, Verbascum Thapsus. Calamintha Clinopodium, Mentha arvensis, Thymus Serpyllum, Origanum vulgare, Teucrium Scorodonia, Nepeta Glechoma. Cynoglossum officinale. Anagallis arvensis, Primula veris. Statice Limonium* (or *Dodartii*), *Armeria maritima. Plantago major, P. lanceolata, P. Coronopus. Beta maritima. Rumex Acetosa. Urtica dioica, U. urens. Allium Ampeloprasum, Scilla nutans. Zostera marina. Carex* (2 species, not identified). *Dactylis glomerata, Festuca maritima, Briza media, Arrhenatherum avenaceum. Pteris Aquilina, Asplenium Ruta-muraria, A. marinum, Scolopendrium vulgare. Parmelia parietina, P. saxatilis, Scyphophorus pyxidatus, Cladonia rangiferina, Agaricus prunulus, A. oreades.*

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* [The absence from the list of *C. glomeratum* and *C. vulgatum* suggests a doubt as to whether one of these is not intended.—Ed. Journ. Bot.]

† [By this, *E. maritimum*, which Lightfoot noticed here in abundance (see p. 269), is probably meant.—Ed. Journ. Bot.]

THE TOWTON ROSE (p. 317).—I have no doubt that this is *Rosa spinosissima*. I have seen it all along on the Permian limestone about Towton.—WM. WEST.

NOTICES OF BOOKS.

A Manual of Orchidaceous Plants. Parts VI. & VII. James Veitch & Sons, 544, King's Road, Chelsea. 1890–91. Price 10s. 6d. each.

THIS valuable work is steadily progressing, and Parts VI. & VII. are now before us, the former treating of *Cœlogyne*, *Epidendrum*, *Spathoglottis*, *Phaius*, *Thunia*, *Chysis*, *Pleione*, *Calanthe*, *Diacrium*, *Nanodes*, and a few other small genera, the latter containing *Phalænopsis*, *Aërides*, *Vanda*, *Angræcum*, *Saccolabium*, and allied genera.

Only those species are mentioned which are or have been cultivated in the glass-houses of Great Britain. Indeed, unless there were some limit of this kind, the work would require far more space than Messrs. Veitch are prepared to give. For example, the genus *Epidendrum* alone contains more than 400 species; of these, 60 of the most beautiful, with their varieties, are described in Part VI. of the *Manual*, exclusive of that highly interesting and distinct species which has been referred to *Epidendrum* by the authors of the *Genera Plantarum*, but which is more widely known under its old generic name of *Nanodes*. This is not to be wondered at, considering how very different in habit *Nanodes* is from the ordinary Epidendrums. For the same reason, *Pleione* is kept distinct from *Cœlogyne*, and the authors have followed the *Genera Plantarum* in adopting Lindley's genus *Diacrium*. *Thunia* is kept distinct from *Phaius*, from which it is distinguished by having "no pseudo-bulbs, but jointed, biennial stems, slightly nodose, and invested with leafy sheaths below that gradually pass upwards into true leaves."

The genus *Aërides* is almost exhaustively treated in Part VII., and among the twenty species and varieties described are some of the latest additions to the genus. The *Phalænopsis*, or "Moth Orchids," are also well done, but it will be long before gardeners will adopt the name *amabilis* for a plant so well known to them under the name of *P. grandiflora*; or adopt the Reichenbachian name of *Aphrodite* for the plant better known as *amabilis*. The confusion, for which Dr. Lindley is responsible, is perplexing, but it is clearly explained in the text.

The plant described as *Aeranthus Leonis* by Reichenbach is here transferred to *Angræcum*, and those who so regard it, and who wish to cite the first publication of *Angræcum Leonis*, will find some difficulty in adding an authority for the name. The *Manual* is anonymous, but we believe Mr. Adolphus H. Kent is its author, at any rate so far as the botanical portion is concerned. This, however, does not appear, and "Hort. Veitch" (at best not a satisfactory citation) is hardly justified.

The description of each species is particularly clear, and it is evident that no pains have been spared to obtain correct information

as to the date of discovery and introduction to cultivation. Besides this, references to the most important orchidic works are given, and many species are accurately figured.

JOHN WEATHERS.

Bacteria and their Products. By G. S. WOODHEAD, M.D. (Walter Scott, London, 1891). Contemporary Science Series. Pp. xiii. 459. 20 photo-micrographs. Price 3s. 6d.

DR. WOODHEAD has given in this book such an account of Bacteria as may be understood by the educated public. While the literature of Bacteriology has been addressed for the most part to botanical and medical readers, it is idle to suppose that the general public have been neglected in attentions of this kind. De Bary's admirable *Lectures on Bacteria* contains an introduction to the subject in every way sufficient for naturalists, and possesses at the same time that masterly touch which makes them as readable as a book on a scientific subject may well be. Similarly, Klein's *Micro-organisms and Disease* treats with prominence the medical side of the subject, and yet is a fitting book for other readers than medical ones. A certain amount of progress has certainly been made, especially from the medical point of view, since these books were published, but the general standpoint remains much as it was.

Dr. Woodhead has therefore entered the lists against powerful competitors for public favour. His book is different in plan and in execution from these, and does not reach their level of excellence. All the same, it is a good book, and a handy one for a medical student or practitioner, as well as for the public. One wishes that it were better written here and there—the author has tried to put too much into it. Dr. Woodhead is a worker of experience and distinction in this field, and his book possesses the merit of being a trustworthy guide over a path that he has not been at much pains to level or make straight. The introductory chapter and the next, "What are Bacteria?" and the third, on the "History of Bacteriology," are by no means so satisfactory as the later portions of the book. The chapters on "Bacteria as the causes of Disease," on Fermentation, and on the typical diseases selected for discussion, are all of them better written and more useful than the introductory section, and the chapter on Fermentation is certainly the best thing of its kind in a small compass. There is an appendix dealing with practical matters, and containing tables for the identification of species of Bacteria. So far as the characters selected are concerned (Dr. Woodhead is by no means alone to blame in using such a method), they cannot fail to meet with the disapproval of every naturalist, since they are mainly physiological characters. Lichenology alone, of all other branches of Systematic Botany, remains in this dark state with less excuse than Bacteriology. The time is surely ripe for an organised mission equipped with tracts on the Natural System by Prof. Oliver and others to our benighted brethren in Lichenology and Bacteriology. It is a pity that a book, which is, after all, an excellent bargain for its small price, should be disfigured by illustrations by some smudge process.

G. M.

ARTICLES IN JOURNALS.

Bot. Centralblatt (No. 39). — P. Taubert, 'Zur Nomenclatur einiger Genera und Species der Leguminosen.' — (Nos. 40–42). P. Kuckuck, 'Beiträge zur Kenntniss der *Ectocarpus*-Arten der Kieler Föhrde.' — (No. 40). R. Sernander, 'Einige Beiträge zur Kalktuff-Flora Norrlands.' — (No. 41). P. Kunth, 'Die Bestäubungseinrichtung von *Armeria maritima*.' —(No. 42). G. Tanfiljef, 'Ueber subfossile Strünke auf dem Boden von Seen.'

Bot. Gazette (Sept. 15). — J. M. Coulter, 'The Future of Systematic Botany.'—S. Watson, *Golionema* (= *Oligonema* S. Wats., non Rostafinski).

Bot. Zeitung (Sept. 25–Oct. 16). — C. Vogler, 'Beiträge zur kenntniss der Reizerscheinungen.'

Bull. Torrey Bot. Club (Sept.). — N. L. Britton, Rusby's S. American Plants (*Rubiaceæ—Calyceræ*).—Id., 'New or Noteworthy N. American Phanerogams' (*Ammannia Koehnei*, sp. n.).—(Oct.). E. L. Sturtevant, 'Some names for *Cucurbitæ*.' — G. F. Atkinson, *Sphærella gossypina*, sp. n. (1 plate). — B. D. Halsted, 'A new Egg-plant disease' (*Phoma Solani*, sp. n.).

Gardeners' Chronicle (Oct. 3). — *Abies Webbiana* (figs. 46–48).—(Oct. 10). *Thunia Mastersiana* Kranzlin, sp. n.—(Oct. 17). *Ornithogalum Saundersiæ* Baker, sp. n.

Journal de Botanique (Sept. 1, 16; Oct. 1). — J. Vesque, 'La tribu des Clusiées, résultats généraux d'une monographie morphologique et anatomique de ces plantes.' — N. Patouillard, 'Contributions à la Flore mycologique du Tonkin.' — —. Hue, 'Lichens de Canisy.'—(Sept.). P. Van Tieghem, 'Sur la structure primaire et les affinités des Pins.'—P. Hariot, 'Sur quelques *Cœnogonium*.'—(Oct. 16). P. Viala & C. Sauvageau, 'Sur quelques Champignons parasites de la Vigne.' — E. Bescherelle, 'Selectio novorum Muscorum.'—E. Belzung, 'Remarques sur le verdissement.'

Nuovo Giornale Bot. Ital. (Oct. 5). — L. Micheletti, 'Elenco di Muscinee raccolte in Toscana.' — G. Cuboni, 'Una nuova specie di fungo excipulaceo' (*Phæodiscula*, gen. nov.).—R. Pirotta, '*Puccinia Gladioli* Cast.'—U. Caleri, 'Alcune osservazioni sulla fioritura dell' *Arum Dioscoridis*.' — G. Arcangeli, 'I pronubi dell' *Helicodiceros muscivorus*.'— G. Cicioni, '*Adonis flammea*.'— Crittogame dell' Alta Birmania. — E. Tanfani, *Silene apetala & S. sericea*. — U. Martelli, 'Il Black-rot sulle viti presso Firenze.'

Oesterr. Bot. Zeitschrift (Oct.).—A. v. Degen, 'Ergebnisse einer botanischen Reise nach der Insel Samothrake.' — K. Rechinger, 'Beiträge zur Flora von Oesterreich.' — R. F. Solla, 'Bericht über einen Ausflug nach dem südlichen Istrien.'—A. Schott, 'Ueber das Verhältniss von *Phyteuma spicatum* zu *P. nigrum*.'

Scottish Naturalist (Oct.). — C. C. Babington, 'Plants seen in Valley of Braemar and on Morrone.' — A. Bennett, 'Record of Scottish Plants for 1890.'

*OBITUARY.**

We regret to record the death of the Rev. Percy Watkins Fenton Myles, which took place at his residence at Ealing on Wednesday, Oct. 7th. Mr. Myles was born at Kilmoe, Co. Cork, on Feb. 27th, 1849, was educated at Tipperary Grammar School, and in 1867 entered Trinity College, Dublin, where he graduated as B.A., and became Senior Moderator and Gold Medallist in English language and literature. In 1870 he took deacon's orders in the Church of



England, and was ordained priest in 1873 by the Bishop of Lichfield. He held various curacies, mostly in or near London, and settled at Ealing in 1884. Here he threw himself with great energy into literary and scientific work, taking a prominent part in the local Natural History Society, and later devoting himself with great energy to the development of the Selborne Society. He was mainly responsible for the establishment of the Society's Magazine, *Nature Notes*, from its beginning in January, 1890; during the present year its management entirely devolved upon him, and he devoted to it the remarkable energy which characterised his work in connection with anything which he undertook.

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* The accompanying portrait is from the October number of *Nature Notes*, in which will be found a fuller biography of Mr. Myles.

In the autumn of last year, Mr. Myles was attacked by a complication of diseases, first manifested by a paralytic seizure, and although he partially rallied, his health has ever since been a cause of anxiety to his friends, who were, however, unable to induce him to take that rest which would have conduced to his recovery. A serious attack of illness in June increased the anxiety, and in the middle of September Mr. Myles was induced to visit a London physician, who confirmed the worst fears that had been formed, and stated that the end could not be far off. He did not again leave his home until his body was taken out to be buried in the Kensington Cemetery at Hanwell.

Mr. Myles was elected a Fellow of the Linnean Society on Dec. 15th, 1887, and, until his health failed, was a constant attendant at its meetings. He took up Botany with much ardour, and reviews from his pen will be found in this Journal for 1888, 1889, and 1890. The most important of these is the elaborate analysis of Bennett & Murray's *Handbook of Cryptogamic Botany*, which appeared in September, 1889. He also compiled for Nicholson's *Dictionary of Gardening* a 'Pronouncing Dictionary' of the Latin names of plants, which shows much careful research.

He was a man of extensive reading and varied information, and was always ready to place his stores of knowledge at the disposal of anyone who asked his help. He had the warm heart and the warm temper, as well as the ready wit, characteristic of his race; and also a certain open-handed disregard of prudential considerations, which prevented him from devoting himself to remunerative work. If there was anything he could do, he was ready and willing to do it, even when the work was unremunerative or (as sometimes happened) involved actual expense. As a consequence of this, no provision exists for his widow, who has been a devoted assistant to him in his various undertakings. It has been thought that some would like to mark their appreciation of their deceased friend by contributing towards supplying this deficiency: the Rev. Prof. Henslow, Drayton House, Ealing, W., a warm friend of Mr. Myles, has kindly consented to receive such contributions, or they may be forwarded to the Editor of this Journal.

BOOK-NOTES, NEWS, &c.

The Revs. E. F. and W. R. Linton, R. P. Murray, and W. Moyle Rogers propose issuing a limited number of "sets" of British Rubi. The first fasciculus, containing twenty-five forms, will be ready early next year: price one guinea. It is meant that three more fasciculi should complete the set. Intending subscribers should send without delay to the Rev. E. F. Linton, Crymlyn, Bournemouth.

We have much pleasure in announcing that the great Index of Genera and Species of Flowering Plants, on which Mr. Daydon Jackson has been continuously engaged for nearly ten years, has

attained its final stage. The revision has so far progressed that the first instalment has been put in the hands of the printers, and in due course a prospectus will be issued for the information of subscribers. The work is receiving the invaluable attention of Sir Joseph Hooker, who, besides carefully annotating the manuscript, has undertaken the care of the geographical distribution. Although the printing will be proceeded with the utmost practicable speed, yet the magnitude of the work will make its passage through the press a long one, and some time must necessarily pass before the completion of the printing. The excellence of the typographical arrangement is assured, the Delegates of the Oxford Clarendon Press having undertaken the duties of publishing the *Index Kewensis Nominum Omnium Plantarum Phanerogamarum* (1735–1885).

Dr. Sereno Watson's last *Contributions to American Botany*, issued July 31st, contains descriptions of new North American and Mexican species, with a revision of the American species of *Erythronium*; a new wild species (*Zea nana*) of Maize from Mexico; and notes on a collection made by Mr. E. G. Loomis, in 1889, in the Island of Ascension, in which three new species—*Rubus nanus*, *Asplenium Ascensionis*, and *Nephrodium? viscidum*—are described.

We have received the *Smithsonian Report* for 1888, which contains Prof. Dana's biography and bibliography of Asa Gray, and a report on the progress of Botany during 1887 and 1888 by Mr. F. H. Knowlton; also the volume for 1889, in which is the address on Botanical Biology delivered by Dr. Dyer at the British Association in 1888.

Ichthyomethia is the euphonious substitute for *Piscidia* which, as Mr. A. S. Hitchcock points out in *Garden and Forest* for Oct. 7th, must, on the ground of priority, be adopted. This is undoubtedly the case, however much we may regret it; for the longer name was published by Patrick Browne in his *Natural History of Jamaica* (p. 296) in 1756, while *Piscidia* of Linnæus dates from 1759. Linnæus called the plant *Piscidia Erythrina*, by which name it has ever since been known until this year, when Prof. Sargent, finding that Linnæus had first named it *Erythrina Piscipula*, started the brand-new synonym *Piscidia Piscipula* (*Garden and Forest*, Sept. 16), which has lasted just three weeks. The plant, Prof. Sargent points out, must now be called *Ichthyomethia Piscipula* Hitchcock, and to this we do not demur, as Mr. Hitchcock has a right to choose his own specific name.

Dr. Britton is proceeding apace on his campaign of restoration and destruction. In the September number of the Torrey *Bulletin* he makes the following changes:—

Neckeria Scop. (1777)	vice	*Corydalis* Vent. (1803).
Bikukulla Adans. (1763)	,,	*Dicltra* Backh. (1797).
Coronopus Hall. (1768)	,,	*Senebiera* DC. (1799).
Pombalia Vandelli (1771)	,,	*Ionidium* Vent. (1803).
Kraunhia Raf. (1808)	,,	*Wisteria* Nutt. (1818).
Cruminium Desv. (1826)	,,	*Centrosema* Benth. (1840).
Vleckia Raf. (1808)	,,	*Lophanthus* Benth. (1829).

Neckeria, which "has been adopted for *Corydalis* by Mr. N. E. Brown in his forthcoming *Supplement to English Botany*," will prevent the use of *Neckera* Hedw. for a genus of Mosses, and this will take the name *Paraphysanthus*, while our two species of *Coronopus* stand, according to Dr. Britton:—

"*Coronopus didymus* (L.), Smith."
"*Coronopus Coronopus* (L.)"

The latter combination, however, for which Dr. Britton is responsible, will of course not be adopted by botanists generally for the plant, which will stand as *Coronopus Ruellii* Gaertn. (1791), while the former is *C. didyma* Smith. We note that the proposed duplication of names is not approved by Prof. Greene, who sees in it "a natural unfitness which all our sense of what is proper in nomenclature shrinks from" (*Pittonia*, ii. 214).

A RECENT number of the *Botanisches Centralblatt* is almost wholly occupied with a paper by Dr. Taubert on the nomenclature of some genera and species of *Leguminosæ*. Dr. Taubert finds that the following genera of Aublet take precedence of the names by which they have usually been known:—

Deguelia Aubl. = *Derris* Lour.
Coublandia Aubl. = *Muellera* L. f.
Coumarouna Aubl. = *Dipteryx* Schreb.
Tounatea Aubl. = *Swartzia* Schreb.
Vouapa Aubl. = *Macrolobium* Schreb.
Apalatoa Aubl. = *Crudia* Schreb.

Assuming that these genera were properly established by Aublet, Dr. Taubert is no doubt justified in pointing this out: but his conduct in enumerating the species of each, and adding his own name to the new combination, is contrary to general practice, and, we must add, to right feeling and good taste. In cases where a restitution of an old generic name has been established, it has been customary to leave the specific combinations as a whole to be dealt with by a monographer of the genus: and this has the further advantage of preventing an undue increase of synonyms, as most monographers sink a certain number of species, which thus do not need re-naming. There is no evidence that Dr. Taubert has studied any one of the genera for the species of which he claims to stand as authority. It is evidently not only "authors of local floras" who, as Prof. L. H. Bailey puts it, "obtain a cheap notoriety by making new combinations."

A CATALOGUE of British Mycetozoa, based on the collection in the British Museum, is being prepared by Mr. Arthur Lister. It will aid Mr. Lister very materially in his undertaking if specimens illustrating the distribution of these remarkable organisms in Britain be sent to the British Museum for incorporation in this catalogue. Their almost universal occurrence on old stumps and in leaf-rubbish heaps makes this request easy of fulfilment; and guidance to the nature of the objects sought may be found in the excellent illustrations which accompanied Mr. Lister's paper in our September number.

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The Plate to Mr. West's article (p. 353) is by an accident delayed till January.

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THE FRESHWATER ALGÆ OF MAINE.

By William West, F.L.S.

(Plate 315.)

By the kindness of Professor Aubert, of Maine State College, I have been enabled to examine some additional material which he has sent me from gatherings made in the State of Maine. Prof. F. L. Harvey has published two excellent papers on this subject (*Bulletin of the Torrey Botanical Club*, June, 1888; also in vol. xv. No. 7); I have also published two papers in this Journal (Nov. 1888; July, 1889). All the following species are additional to the previous lists; some of them are quite rare, others are additional to the Flora of the United States, and a few species and varieties are new to science. A large majority of the species previously recorded have also been observed from other localities, and some of them very profusely. As the material was again collected for Desmids, there are few other Algæ present in sufficient quantity for naming, save the minute forms.

Zygogonium pectinatum (Vauch.) Kütz. was present in fine conjugation from a locality between Orono and Bangor. *Xanthidium antilopæum* (Bréb.) Kütz. var. *polymazum* Nord. was noticed in fair abundance; it agreed well with the form as described and figured by Nordstedt (*Bidrag till känn om Sydligare Norges Desmidiéer*, p. 38, fig. 20), having the *characteristic hexagonal semicells* of the species, and the distinctive tubercles of the variety, the latter being in the same position as those figured by Nordstedt.

I must not forget to acknowledge the most valuable help of my son, G. S. West, who has aided me considerably in the preparation of this paper.

Gonatozygon Brebissonii De Bary. Scarbro'.

Sphærozosma punctulatum, n. sp. S. filis tortis sine vagina mucosa; cellulæ paulo latius quam longius, sinu sublineari extremo ampliato; semicellulæ subrectangulares pyramidatæve apicibus latissime truncatis; a latere visæ subcirculares; membrana punctata, punctis subconcentrice ordinatis; glandulis connexivis propinquis vel dissitis. Long. 14–16 μ; lat. 17·5–20 μ; lat. isthm. 8–9·5 μ; crass. 10 μ. Figs. 1 and 2.—Scarbro', frequent.

This differs from *S. vertebratum* Ralfs in the different form of its semicells, its different sinus, and its punctate membrane.

S. granulatum Roy et Biss. Long. 9'5–10·5 μ; lat. 9·5–10·5 μ; lat. isthm. 4–5 μ. Scarbro'.

Spondylosium pulchellum Arch. var. *bambusinoides* (Wittr.) Lund. Long. 15 μ; lat. ad bas. semicell. 9·5 μ; lat. ad apic. 5 μ; lat. isthm. 2·5 μ. Scarbro'.

Onychonema læve Nord. Between Orono and Bangor; Scarbro'. —Var. *micracanthum* Nord. Scarbro', much commoner than the type.

Hyalotheca mucosa (Dillw.) Ehrnb. Scarbro'.—*H. dubia* Kütz. var. *lævis* Wittr. (*Anteck. Skand. Desm.* p. 27, fig. 13). Scarbro', rare.

Desmidium cylindricum Grev. Between Orono and Bangor.—*D. Swartzii* Ag. var. *amblyodon* (Itz.) Rabh. Forma membrana distincte punctata. Walker's Frog Pond, Orono.

Closterium moniliferum (Bory.) Ehrnb. Lat. 45 μ. Gorham.—*C. lineatum* Ehrnb. Scarbro'.

C. subangustatum, n. sp. Cl. diametro circiter 25-plo longius, leve curvatum, subrectum ad medium, sensim attenuatum, apices subtruncatos versus; membrana subferruginea, costata (costis 5 in 18 μ), delicatissime punctata. Long. 780 μ; lat. 31 μ; lat. ad apic. 10 μ. Fig. 3. Bog between Orono and Bangor.

This differs from *C. angustatum* Kütz. in being less curved, in having more ribs, and in tapering more towards the ends: it differs from *C. lineatum* Ehrnb. in being costate and not striate, and in being less tapering and less curved towards the extremities. Compare with *C. lineatum* Ehrnb. var. *costatum* Wolle.

C. Delpontii Klebs. Scarbro'.—*C. rostratum* Ehrnb. Between Orono and Bangor.

Penium annulare, n. sp. P. mediocre, circiter 7-plo longius quam latius, subcylindricum, medio constrictum (vel subconstrictum), e medio in apices subtruncatos sensim sensimque sed levissime attenuatum, distincte annulare (cum circiter annulo 14–22); e vertice visæ perfecte circulare; membrana achroa, densissime inordinatimque punctata. Long. 130–177 μ; lat. 20–23 μ. Figs. 5 and 6. Scarbro', abundant. This is a very distinct species.

Var. OBESUM, nov. var. Var. circiter 3-plo longius quam latius cum annulis paucioribus (circiter 9). Long. 106 μ; lat. 31–34 μ. Fig. 7. Associated with the type, rare.

Micrasterias laticeps Nord. Long. 112–125 μ; lat. 112–127 μ; lat. isthm. 20–22 μ. Bog between Orono and Bangor, frequent.—*M. pinnatifida* (Kütz.) Ralfs, var. *inflata* Wolle. Long. 60 μ; lat. 60 μ; lat. isthm. 17·5 μ. Scarbro'. — Var. DIVISA nov. var. Var. lobis inferioribus semicellularum profunde bifidis, utroque lobulo bidentato, membrana punctulata. Long. 61–75 μ; lat. 75–78 μ; lat. isthm. 17·5–20 μ. Fig. 8. Bog between Orono and Bangor.—*M. furcata* Ralfs. Long. 132–140 μ; lat. 98–115 μ; lat. isthm. 20–21 μ. Bog between Orono and Bangor; Scarbro', frequent.—*M. apiculata* (Ehrnb.) Menegh. **fimbriata* (Ralfs) Nord. (*Desmidier fran Bornholm*, p. 190). Scarbro', frequent.

Euastrum verrucosum Ehrnb. var. *alatum* Wolle. Scarbro'.—Var. *reductum* Nord. Scarbro'.—*E. attenuatum* Wolle. Long. 65–75 μ; lat. 30–34 μ; lat. isthm. 8–10 μ; crass. 18 μ. Scarbro', not uncommon.— *E. gemmatum* Bréb. Scarbro' rare. — *E. elegans* (Bréb.) Kütz. var. *bidentatum* Näg. [*E. elegans* (Bréb.) Kütz. var. *speciosum* Boldt (*Desm. fran Grönland*, p. 9, tab. 1, fig. 10)]. Between Orono and Bangor.—*E. denticulatum* (Kirch.) Gay. Between Orono and Bangor.— *E. abruptum* Nord. (*Desm. Brasil*, tab. 2, fig. 3) var. *evolutum* Nord. (*Nonn. Alg. Brasil.* p. 21, tab. 2, fig. 7). Long. 60–75 μ; lat. 42–50 μ; lat. isthm. 10–12·5 μ; crass. 27–30 μ. Scarbro', frequent.

Cosmarium margaritum Wolle. Long. 27–30 μ; lat. 23–24 μ;

lat. isthm. 8 μ; crass. 14 μ. Scarbro'.—*C. protuberans* Lund. var. *granulatum* Wolle. Orono; bog between Orono and Bangor. — *C. pseudoprotuberans* Kirch. Scarbro'. — *C. eductum* Roy et Biss. in *Nord. Desm. fran Bornholm*, p. 198, tab. 6, fig. 8, forma *minor*. Long. 28 μ; lat. 21 μ; lat. isthm. 5 μ. Between Orono and Bangor; Walker's Frog Pond, Orono. — *C. perforatum* Lund. Bog between Orono and Bangor, frequent; Gorham. — *C. pseudopyramidatum* Lund. **stenonotum* Nord. Scarbro'.—*C. atlanthoideum* Delp. Long. 23 μ; lat. 19 μ; lat. isthm. 7·5 μ; crass. 12 μ. Scarbro'. — *C. scenedesmus* Delp. Bog between Orono and Bangor. —*C. bioculatum* Bréb. var. *omphalum* Schaar. (*Magyar Desm.* p. 270, fig. 9). f. *subquadrata*. Forma subquadrata, sinu lineari. Long. 15 μ; lat. 13·5 μ; lat. isthm. 8·5 μ; crass. 9 μ. Fig. 9. Between Orono and Bangor. A form is figured which had several granules near the middle of one of the semicells rather irregularly disposed. — *C. impressulum* Elfv. Scarbro'. — *C. Regnellii* Wille (*Bidrag til Sydam. Alg. Fl.* p. 16, tab. 1, fig. 34). Walker's Frog Pond, Orono; bog between Orono and Bangor. — *C. Meneghinii* Bréb. var. *Wollei* Lagerh. (*Desm. aus Bengal.* p. 8 [*C. Meneghinii* Wolle (*Desm. of U. S.* tab. 16, fig. 7 sinistra, superior.)]. Scarbro', very frequent; Orono.—*C. margaritatum* (Lund.) Roy et Biss. (*Jap. Desm.* p. 194). [*C. latum* Bréb. var. *margaritatum* Lund. (*Desm. Suec.* p. 26)]. Fig. 16. Scarbro', very abundant.—*C. Pardalis* Cohn. Zygosporæ subglobosæ, glabræ. Long. 42–43 μ; lat. 40–43 μ; lat. isthm. 15 μ; crass. 20–22 μ; diam. zygosp. 38–42 μ. Scarbro', abundant. —*C. Blyttii* Wille. Long. 16–19 μ; lat. 16–18 μ; lat. isthm. 5 μ. Scarbro'; Walker's Frog Pond, Orono.—*C. Botrytis* (Bory) Menegh. var. *tumida* Wolle, and *C. ornatum* Ralfs var. *protractum* Wolle. Scarbro'. — *C. quinarium* Lund. Bog between Orono and Bangor. —*C. pulcherrimum* Nord. (*Desm. Brasil.* tab. 3, fig. 24). Scarbro'. —*C. notabile* Bréb. Long. 32 μ; lat. 23 μ; lat. isthm. 9·5 μ; crass. 14 μ. Gorham.—*C. moniliforme* (Turp.) Ralfs var. *punctatum* Lagerh. (*Algologiska Bidrag*, ii. Alg. aus Cuba, Jamaica, und Puerto Rico, p. 197), *C. contractum* Kirchn., and *C. pseudoconnatum* Nord. Scarbro'.

Xanthidium antilopæum (Bréb.) Kütz. var. *Minneapoliense* Wolle. Scarbro'. — *X. cristatum* Bréb. var. *uncinatum* Bréb. Scarbro'.— Var. *uncinatum* Bréb. forma *mucronata*. Forma spinis distincte mucronatis. Long. sine spin. 48 μ; long. cum spin. 58 μ; lat. sine spin. 35 μ; lat. cum spin. 42 μ; lat. isthm. 9 μ; crass. 29 μ. Fig. 11. Scarbro'.

Staurastrum cuspidatum Bréb., *S. megacanthum* Lund., *S. hystrix* Ralfs, *S. spiniferum* West, forma spinis sublongioribus et tenuioribus; and *S. polytrichum* Perty. Scarbro'. — *S. globosum* Roy et Biss. (*Jap. Desm.* p. 237, tab. 268, fig. 8), var. GRANULATUM, nov. var. Var. membrana dense granulata. Long. 80 μ; lat. 50 μ; lat. isthm. 20 μ. Fig. 12. Bog between Orono and Bangor.— *S. arcuatum* Nord. Fig. 13. Scarbro'. — *S. forficulatum* Lund. (*Desm. Suec.* p. 66, tab. 4, fig. 5), var. AMERICANUM, nov. var. Var. sinu glabro; semicellulæ a vertice visæ lateribus glabris. Long. 33–37 μ; lat. 38–45 μ; lat. isthm. 16–17 μ. Fig. 14. Scarbro'.

— Var. ENOPLON, nov. var. Semicellulæ a fronte visæ quam forma typica; a vertice visæ trigonæ, lateribus leviter concavis, aculeis binis subconvergentibus ordinatis, uno utrumque terminum versus posito. Long. 27 μ; lat. 43·5–47 μ; lat. isthm. 15 μ. Fig. 15. Scarbro'.—*S. incisum* Wolle. forma 6-gona. Scarbro', very frequent. — *S. controversum* Bréb. Scarbro', frequent. — *S. vestitum* Ralfs, *S. Sebaldi* Reinsch var. *ornatum* Nord., and *S. iotanum* Wolle. Scarbro'. — *S. tetracerum* Ralfs. Scarbro', abundant; between Orono and Bangor.

Selenastrum Bibraianum Reinsch. Scarbro'.

Polyedrium minimum A. Br. (*P. Pinacidium* Reinsch.), and *P. gigas* Wittr. Scarbro'.

Oocystis crassa Wittr. in Nord. et Wittr. *Alg. Exsic.* no. 355. Scarbro'.

Oscillaria major Vauch. Lat. trichom. 22–23·5 μ. Scarbro'.

Surirella splendida (Ehrnb.) Kütz. Gorham.

Eunotia tridentula Ehrnb. Orono.

Ceratoneis Arcus (Ehrnb.) Kütz. Orono.

Cymbella turgidula A. Schm. Orono.

Cocconema parvum Sm. Orono.

Fragilaria capucina Desmaz. Walker's Frog Pond, Orono.

Diatoma elongatum Ag. and *D. anceps* Ehrnb. Orono.

Synedra biceps Kütz. Between Orono and Bangor.

Nitzschia linearis (Ag.) Sm. and *N. constricta* (Kütz.) Pritch. (*N. dubia* Sm.). Gorham.

Navicula columnaris Ehrnb. and *N. firma* Kütz. Scarbro'. — *N. Amphioxys* Ehrnb. Scarbro'; between Orono and Bangor.—*N. hebes* Ralfs (*N. obtusa* Sm.). Orono.—*N. trinodis* Sm. (*Achnanthidium trinode* Arnott), forma *crassior*. Long. 20 μ; lat. 8 μ. Orono. — *N. Carassius* Ehrnb. Orono. — *N. Dirhynchus* Ehrnb., *N. Amphirhynchus* Ehrnb., *N. producta* Sm., and *N. exilis* (Kütz.) Grun. Scarbro'.—*N. angustata* Sm. Forma apicibus crassioribus. Orono. — *N. dicephala* Ehrnb. Scarbro'. — *N. elginensis* Ralfs and *N. Hitchcockii* Ehrnb. Orono.

Pinnularia radiosa (Kütz.) Rabh., *P. viridula* (Kütz.), Rabh., and *P. Dactylus* Ehrnb. Orono.— *P. polyonca* (Bréb.) Sm. Scarbro'. — *P. divergens* Sm., *P. globiceps* Greg., and *P. Digitus* Ehrnb. Orono.

Stauroneis gracilis Ehrnb. and *S. inflata* Kütz. Orono.

Gomphonema dichotomum Kütz. Orono. — *G. intricatum* Kütz. Scarbro'; Orono.

Tabellaria fenestrata (Lyngb.) Kütz. Between Orono and Bangor.

EXPLANATION OF PLATE 315.

Fig.

1. *Sphærozosma punctulatum*, n. sp. *a*, *a''*, et *c* × 400; *a'* × 625.
2. " " " To show position of connecting glands in
3. *Closterium subangustatum*, n. sp. *a* × 100; *a'* × 400. [another specimen.
4. " " " Central portion × 625.
5. *Penium annulare*, n. sp. × 400.
6. " " " A semicell partly turned over × 400.
7. " " " var. *obesum*, nov. var. × 400.
8. *Micrasterias pinnatifida* (Kütz.) Ralfs, var. *divisa*, nov. var. × 400.

9. *Cosmarium bioculatum* Bréb. var. *omphalum* Schaar. forma *subquadrata* × 625.
10. „ *Pardalis* Cohn. Zygospore × 400.
11. *Xanthidium cristatum* Bréb. var. *uncinatum* Bréb. forma *mucronata* × 400.
12. *Staurastrum globosum* Roy. et Biss. var. *granulatum*, nov. var. × 400.
13. „ *arcuatum* Nord. A cell partly turned over × 625.
14. „ *forficulatum* Lund. var. *Americanum*, nov. var. × 400.
15. „ „ „ var. *enoplon*, nov. var. × 400.
16. *Cosmarium margaritatum* (Lund.) Roy et Biss. × 625.

EUPHORBIA HIBERNA IN CO. DONEGAL.

It is now close upon a hundred years since Robert Brown was with the Scottish Fencibles, as surgeon, in the Co. Donegal. Amongst the botanical records which were the result of that visit, the most interesting and the last remaining unverified is *Euphorbia hiberna*, the Irish Spurge. It is true that Dr. Norman Moore has recorded this species from the Poisoned Glen, near Gweedore, but I have failed to verify this station, and have seen no specimens. Moreover, this is not likely to have been Robert Brown's locality, whose observations were chiefly in Innishowen.

A young botanist, Mr. J. Hunter, now residing at Buncrana, has, however, confirmed the time-honoured observation of the great Robert Brown. Hearing of his devotion to the subject, I introduced myself to him, and asked what success he had had. He told me he had found a spurge, which appeared to be *E. hiberna*, and on applying for any fragments I found that he was right. On Saturday I crossed Lough Swilly and visited the place indicated, where, to my great delight, I found about a hundred yards along the banks of Dunree river, on the west side of Innishowen, apparently well overgrown with the Irish Spurge. Of course it is nearly quite withered at this season, but stalks and a few leaves remained in several places. It is about ten years since I discovered this species in Galway, and it occurs also in the Island of Inish Turk. This further extension of its range brings it right up to the North of Ireland.

The interest of this discovery lies not alone in the authenticating of an old and valued record, nor in the increase of the county flora by so good a species, but in the proof that it affords of the equable mildness of climate extending around the west coast from north to south. Within the last ten years I have been enabled to record several plants confirmatory of this condition of things. I may mention especially *Bartsia viscosa*, *Carum verticillatum*, and *Trichomanes radicans*. *Saxifraga umbrosa* has long been known as a Donegal native. Several others might be mentioned, showing that the equable climate of Kerry and Cork is not confined to Munster in Ireland. The absence of severe frost in Donegal, in the districts along the edge of the Atlantic, is hardly sufficiently known; and my success with tender garden species has surprised many experienced growers. I could show a collection of delicate and half-hardy plants that have lived out with me for several winters, which would, I imagine, astonish many English cultivators.

But I am straying from my subject. I may mention, in con-

clusion, that three other records by Robert Brown were *Saxifraga oppositifolia*, *Saussurea alpina*, and *Carex rigida*. These, he states, grew in Innishowen, and I have verified them many years ago. *Salix herbacea*, recorded without authority from the same locality by Wade, is no doubt Brown's also; it grows there profusely. Their locality (Bulbein Mt.) is about eight miles from the present one, Dunree River. Mr. Hunter has made one other interesting find. He has discovered *Bartsia viscosa* on a hill 300 ft. above sea-level, near Buncrana. It occurs in great profusion on reclaimed land south of Buncrana, and I was much puzzled (see *Journ. Bot.* 1883, p. 49) to account for the source of dissemination. This, however, sets that question at rest.

H. Chichester Hart.

This re-discovery is especially interesting, inasmuch as there can be no doubt that *Euphorbia hiberna* has been found by Mr. Hunter in the very place where Robert Brown discovered it nearly a hundred years ago.

Brown's discovery seems to have been first printed by Mackay in 1836, who merely gives, "County of Donegal; Robert Brown, Esq., LL.D." (*Flora Hibernica*, i. 236) as the locality. Whether Mackay derived this information first-hand, or through Brown's friend Templeton, whose aid he specially acknowledges, does not appear: but Brown is not mentioned in the preface to *Flora Hibernica*. In *Cybele Hibernica* (p. 259) we read: "In the county of Donegal (Robert Brown); *Flor. Hib.* (not found by any other botanist)": and up to the present time no confirmation of the statement has been received.

In this Journal for 1888, p. 285, I referred to the diary kept by Robert Brown at Londonderry, in 1800, now in the Botanical Department of the British Museum. The half-promise then made of an abstract of this interesting volume is, I regret to say, unfulfilled; but on receiving Mr. Hart's note I thought it well to examine the diary, to see whether Brown had made any reference to his discovery of this Spurge: and I was interested to find that Mr. Hunter's locality is identical with that of Brown. Writing on May 27th, he says: "Wrote the Journal of yesterday, in w^{ch} I forgot to mention my having found Euphorbia hiberna by the River-side near the Mill of Dunrea, abundantly"; and on the same day he further notes, "Described Euphorbia hyberna."* On the 31st he notes: "Walk'd about a mile up the side of the River at Dunrea—Euphorbia hyberna grows in great abundance."

On the 16th of July Brown was at Dundalk, and visited "the late Earl Clanbrassil's Gardens—a tolerable collection of exotics chiefly stove plants—few hardy plants. . . . Mr. Read the Gardiner found Euphorbia hyberna in the County of Mayo." Mr. A. G. More informs me that it is only recorded for that county from Inish Turk: the plant is not easily mistaken. Will Irish botanists look out for it on the mainland, where Read probably found it?

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* This is the spelling employed by Linnæus, Sp. Pl. i. 462.

The Belfast locality has, I think, been too readily set aside. The authors of the *Flora of the North-east of Ireland* say (p. 300) :—"Specimens were sent to London, from the garden at Cranmore, to be figured in *English Botany*. By inadvertence they were noted by Sowerby as wild. If Templeton claimed this as a Belfast plant, there would be some note to that effect in his MS. catalogue. No such note can be found." Templeton's omission and the fact that the plant has eluded the researches of those engaged on the *Flora* certainly militate against the claims of the *Euphorbia* as a Belfast plant; but the first two sentences quoted are pure assumption, based on a suspicion expressed by the authors of *Cybele Hibernica*, p. 259 :—"Mr. W. Carruthers tells us that the specimen from which the drawing in *English Botany* was made is still preserved in the British Museum, labelled by Sowerby as found by Mr. Templeton 'wild in the neighbourhood of Belfast, flowering in June.' As the plant has not recently been found by any one of the many diligent botanists who have recently explored that neighbourhood, we cannot but fear that this specimen may have been derived from Mr. Templeton's garden." I have looked up both Sowerby's specimen and his drawing: the former is labelled "Templeton, Ireland"; and on the latter is written: "*Euphorbia hyberna*. Mr. Templeton, near Belfast, Ireland." In E. B. 1337 Smith states: "Mr. Templeton has favoured us with fresh wild specimens from the neighbourhood of Belfast, flowering in June": and it is this sentence, not either of the labels, that is paraphrased by Mr. Carruthers.

JAMES BRITTEN.

THE MOSSES OF CO. DONEGAL.

BY H. N. DIXON, M.A., F.L.S.

DURING a stay of a fortnight in the North of Ireland, in July, 1890, the first part of the time spent in Antrim, the last ten days in Donegal, I made a small collection of mosses; and as there is very little record of these plants from the latter county, it may be worth while to publish a list of the species collected there; the rather that while no plants of any great rarity will be found included, there is sufficient indication, I think, of an interesting moss-flora for future bryologists, considering that these were the spoils of but little more than a week, for the most part the *obiter lecta* of a trip undertaken for recreation rather than for botanical ends.

The two days I spent at Gweedore, about Errigal and the Poisoned Glen, satisfied me that a more prolonged search would be well repaid; while the isolated grandeur of Errigal and the eerie solitude of the Poisoned Glen are attractions of scenery which alone would make one well pleased to linger in their neighbourhood. It was also a matter of great regret to me that three or four hours were all the time I was able to devote to Slieve League, one of the grandest pieces of coast scenery in Britain: a mountain one side of whose razor-like edge falls nearly 2000 ft. in almost sheer descent into the

sea, the other a chaos of fallen crags overgrown with fern and heather, moistened by the vapour of an almost eternal veil of cloud, and by the rains of one of the rainiest parts of dampest Ireland; every nook and cranny filled with a luxuriant growth of moss, and bright, almost brilliant with orange and purple cushions of *Herberta adunca* and *Pleurozia cochleariformis*. This part would, I am assured, well repay careful search.

The following list is one merely of those species gathered and brought home by me; I had no intention at the time of drawing up a list, and most of the commoner species therefore passed unnoticed; it has no pretensions to being even the basis of a county-list.

The only records from Donegal that I have found are six species in Moore's 'Synopsis of the Mosses of Ireland,' 1873, viz., *Weissia mucronata* Bruch, *Campylopus Schwarzii* Schpr., *Mnium affine* Bland., *Oligotrichum hercynicum* Ehrh., *Cylindrothecium concinnum* De Not., and *Brachythecium salebrosum* var. *Mildeanum* Schpr.: and "*Campylopus setifolius*, Slieve Snacht West, *Moore*," which I take to refer to Co. Donegal, in Braithwaite, *Brit. Moss Flora*, Suppl. to vol. i. Mr. David McArdle (to whom I am much indebted for information on the subject) also informs me that he is not aware of any list subsequent to Dr. Moore's publication. I have followed, for the sake of simplicity, the nomenclature and order of the *London Catalogue*, 2nd edition.

Sphagnum molle var. *tenerum* Sull. A very close compact form of this species, which I take to be the above variety, in full fruit, Doocharry Bridge.—*S. tenellum* Ehrh. Poisoned Glen.

Andreæa petrophila Ehrh. Summit of Errigal.—*A. alpina* Turn. Summit of Errigal.—*A. Rothii* W. & M., with the var. *falcata* Schpr. Poisoned Glen.

Gymnostomum rupestre Schwg. Slieve League.

Anœctangium compactum Schl. Poisoned Glen.

Dichodontium pellucidum var. *serratum* Schpr. Slieve League.

Rhabdoweissia fugax Hedw. Errigal.

Dicranum fuscescens Turn. Slieve League. — *D. Scottianum* Turn. Errigal; Poisoned Glen.

Campylopus atrovirens De Not. Gweedore, &c. — Var. *falcatus* Braithw. Doocharry Bridge. — *C. brevipilus* B. & S. Poisoned Glen. — *C. flexuosus* Brid. Poisoned Glen; Horn Head. — *C. setifolius* Wils. Foot of Errigal; very fine in Poisoned Glen. — *C. Schwarzii* Schpr. Summit of Errigal, in beautiful bright green tufts, four or five inches high. Doocharry Bridge.—*C. fragilis* var. *densus* Schl. Letterkenny; Horn Head.—*C. pyriformis* Brid. Horn Head.

Blindia acuta Hedw. Poisoned Glen; Horn Head. The latter a form approaching *B. trichodes* Wils., of which it has the leaves, but with the fruit and the robust habit of the type. The Rev. H. G. Jameson has moreover pointed out to me that Wilson's specimens of *B. trichodes* exhibit a distinct character of areolation in the apex of the excurrent nerve, the cells being of a much more elongated character than in *B. acuta*; and this appears to afford a ground for

distinguishing the two forms when the fruit is absent, and the leaf *form* that of the variety.

Didymodon cylindricus Bruch. Summit of Errigal; Poisoned Glen.

Ditrichum homomallum Hedw. Poisoned Glen. — *D. flexicaule* Schwg. Falcarragh.

Trichostomum crispulum Bruch. Horn Head.— *T. littorale* Mitt. Poisoned Glen.

Barbula ruralis var. *arenicola* Braithw. Sand-hills, Horn Head.

Distichium inclinatum Hedw. Falcarragh.

Grimmia funalis Schwg. Dungloe. Rocks at foot of Errigal.— *G. trichophylla* Grev. Letterkenny, c. fr. *G. maritima* Turn. Horn Head.—*G. pulvinata* Dill. Horn Head.

Racomitrium heterostichum Hedw. and var. *alopecurum* B. & S. Errigal. — *R. patens* Dicks. Summit of Errigal. — *R. ellipticum* Turn. Errigal.—*R. protensum*. Doocharry Bridge.—*R. sudeticum* Funck. Errigal.

Glyphomitrium Daviesii M. Foot of Errigal. Poisoned Glen.

Ptychomitrium polyphyllum Dicks. *Passim*.

Zygodon conoideus Dicks. A few stems mixed with other mosses from Gweedore.

Ulota calvescens Wils., *U. crispa* Hedw., *U. phyllantha* Brid. All three species growing together, and in the same tuft in some cases. Poisoned Glen.—*U. Hutchinsiæ* Sm. Poisoned Glen.

Orthotrichum saxatile Brid. Letterkenny. — *O. pulchellum* Sm. Kilmacrenan.

Oedipodium Griffithianum Dicks. Crevices of rocks on summit of Errigal. This is, I believe, the first record of this interesting moss in Ireland.

Splachnum sphæricum L. fil. Poisoned Glen.

Entosthodon Templetoni Hook. Horn Head.

Philonotis calcarea B. & S. Falcarragh. Slieve League.

Bryum inclinatum Swartz. Letterkenny.—*B. alpinum* L. Doocharry Bridge, in fruit, and with the remains of abundant fruit of the preceding year.—*B. filiforme* Dicks. Poisoned Glen.

Mnium punctatum Hedw. Horn Head.

Fissidens osmundoides Hedw. Slieve League. — *F. adiantoides* Hedw. Doocharry Bridge.

Brachythecium plumosum Swartz. Poisoned Glen.

Eurhynchium myosuroides L. Slieve League. A form with closely imbricated leaves, often suddenly attenuated into a hair-like point; the nerve occasionally bifid and short.

Plagiothecium Borrerianum Spruce. Errigal.

Hypnum aduncum Hedw. Horn Head, on sand-hills. A very abnormal form, growing on moist sand; with delicate almost filiform stems and branches of a golden-yellow colour, and strongly falcate leaves; in habit resembling one of the smaller species of *Drepanium* rather than a *Harpidium*, but with wider laxer areolation, and single nerve.—*H. exannulatum* Gümb. Letterkenny.

Among the mosses I collected in rapidly passing round the coast of Antrim were a few not mentioned in Stewart's 'List of the

Mosses of the North-east of Ireland,' 1875. I have given a list of these below, with a few additional species which, though previously recorded, seemed, on account of their apparent rarity in that district, to deserve mention :—

Gymnostomum curvirostre Ehrh. Glenarm. — *G. microstomum* Hedw. Ballycastle.

Dichodontium pellucidum L. Cushendall. Ballycastle. — Var. *serratum* Schpr. Ballycastle.

Dicranella cerviculata Hedw. Ballycastle. — *D. Schreberi* var. *elata* Schpr. Cushenhall.

Campylopus Schimperi Milde. A tuft of moss gathered at the Giant's Causeway appears to be this species, though differing in the absence of the tomentum usually binding together the stems of that plant.

Pottia Heimii Hedw. Giant's Causeway.

Trichostomum crispulum Bruch. Ballycastle, c. fr. *T. littorale* Mitt. Ballycastle. Cushendall.

Eucladium verticillatum L. Glenarm.

Ditrichum homomallum var. *zonatum* Lorenz. I found what I take to be this var. growing in sandy ground near Ballycastle.

Barbula cylindrica Tayl. Cushendall.

Grimmia Hartmanni Schpr. Fair Head.

Orthotrichum cupulatum Hoffm. Glenarm.

Funaria calcarea Wahl. Near Carrick-a-Rede.

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ*.

By Edmund G. Baker, F.L.S.

(Continued from p. 172.)

§§ *Flores pro magnitudine plantæ majusculi et speciosi pedunculo cum petiolo plus minus connato.*

† Acaulia.

A. Folia varie lobata sed non rite pinnatipartita nec secta.

* Folia tripartita.

65. M. PICHINCHENSE A. Gray, Bot. U.S. Explor. Exp. p. 152; Wedd. Chlor. And. ii. p. 278. *Sida pichinchensis* Humb. et Bonpl. Pl. Æquin. ii. p. 115, t. 116; DC. Prod. i. p. 466.

Hab. Ecuador! Mt. Pichincha! Antisana! & Chimborazo!

66. M. PHYLLANTHOS A. Gray, *l. c.* p. 152; Wedd. *l. c.* p. 278. *Sida Phyllanthos* Cav.; Humb. & Bonp. Nov. Gen. v. p. 264; DC. Prod. i. p. 474. *S. saxifraga* Humb. & Bonp. Pl. Æquin. p. 116, in adnot.

Hab. Ecuador! Peru.

67. M. BORUSSICUM Wedd. *l. c.* p. 278. *Sida borussica* Meyen, Reise Um die Erde, ii. p. 31.

Hab. Peru, nr. Lake Titicaca!

** Folia obcuneata vel spathulata palmatim lobata.

68. M. COMPACTUM A. Gray, *l. c.* p. 152, in adnot.; Wedd. *l. c.* p. 279, t. 80, B. *Sida compacta* Gay, Fl. Chil. i. p. 329.

Hab. Chili!

69. M. CLANDESTINUM. *Sida clandestina* Ph. in Flor. Atacam. p. 11.

Hab. Chili; Desert of Atacama.

70. M. MEGALORRHIZUM. *Sida megalorrhiza* Ph. *l. c.*

Hab. Chili; Desert of Atacama.

71. **M. obcuneatum**, n. sp. — Acaule caudice ramoso ligneo, foliis petiolatis limbo quam petiolo multo breviore obcuneatis inferne integris superne palmati-lobatis lobis inæqualiter crenatis vel incisis supra albo-tomentosis subtus fere glabris, floribus circiter medio petiolo insertis, calyce campanulato dentibus triangularibus externe albo-tomentosis, petalis cæruleis calyce parum superantibus, carpellis 8–10 hirtis.

Hab. Bolivia, nr. La Paz, *Mandon*, No. 799! Herb. Mus. Brit.

Root 2–3 in.; leaf petiole $\frac{1}{2}$–$\frac{3}{4}$ in.; lamina $\frac{1}{3}$ in. long; calyx $\frac{1}{4}$ in.; petals $\frac{1}{3}$ in.

72. **M. condensatum**, n. sp. — Acaule, caudice crasso multicipite ligneo, foliis breviter petiolatis lamina obcuneatis inferne integro superne 5–7-palmati-lobatis lobis oblongis obtusis supra albo-lanato-tomentosis subtus fere glabris, floribus ad imam petioli insertis, calyce tubo longo campanulato dentibus triangularibus externe albo-lanato-tomentosis, petalis nigro-cæruleis calyce parum superantibus, carpellis 10–12 cuspidatis villosis.

Hab. Peru, *Lechler*, No. 1972! Hb. Kew.

May be recognised by the white woolly tomentum and dark blue flowers.

Root 4–5 in. long; leaf, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; lamina $\frac{1}{3}$ in.; calyx $\frac{1}{3}$ in.; petals $\frac{1}{3}$ in.

73. M. FLABELLATUM Wedd. *l. c.* p. 281.

Hab. Bolivia; Illimani, *Pentland;* La Paz, *d'Orbigny;* Sorata, *Mandon*!

The leaves of this plant are occasionally pinnately lobed.

74. **M. parviflorum** Philippi in herb. Kew ined. — Nanum cæspitosum acaule albo-tomentosum, foliis parvis petiolatis junioribus palmatim crenatis vel lobatis senioribus bifidus segmentis palmatim crenatis vel lobatis lobis parvissimis oblongis obtusis, floribus solitariis in petiolo inter stipulis lanceolatis et juxta foliam insertis, calyce campanulato vesicario, sepalis triangularibus acutis parce albo-tomentosis, petalis brevibus, carpellis circiter 8 dorso rotundatis biaristatis aristis pubescentibus.

Hab. Chili; Atacama, *Philippi*!

This is the smallest of all the Malvastra. It may be easily told by its densely cæspitose habit and white tomentum.

*** Folia digitatim 5–7 lobata.

75. M. PEDICULARIÆFOLIUM A. Gray, *l. c.* p. 152; Wedd. *l. c.* p. 280. *Sida pediculariæfolia* Meyen, Reise um die Erde, p. 460.

Hab. Peru, nr. Tissaloma, *Meyen*! Cordillera de Tacora, *Weddell*. Chili, Atacama, *Philippi*! Bolivia, Lagunas de Potosi, *d'Orbigny*; Andes of Pelechuco, *Pearce*!

76. **M. rugosum** Philippi in herb. Kew. ined. — Acaule radice crasso verticali, foliis parvis longe petiolatis digitatum lobatis lobis pinnatisectis crispis albo-tomentosis petiolis glabris, floribus solitariis circiter medio petioli inter stipulas sessilibus, calyce campanulato tubo glabro dentibus parvis ovatis albo-tomentosis.

Hab. Chili; Cordillera of Tarapaca, *R. A. Philippi*!

This plant resembles the preceding, but is smaller in all its parts. Root 2 in.; leaf, petiole $\frac{3}{4}$ in.; lamina $\frac{1}{3}$ in.; calyx $\frac{1}{5}$ in.

** Folia biternata.

77. M. Macleani A. Gray, *l. c.* p. 152, in adnot.; Wedd. *l. c.* p. 280.

Hab. Peru; Cordilleras, *Maclean*.

*** Folia ovata vel oblonga flabellatim multilobata.

78. M. ulophyllum A. Gray, *l. c.* p. 150; Wedd. *l. c.* p. 280.

Hab. Peru; Andes of Alpamarca, *Pickering;* between Puno and Arequipa, *Weddell*.

*** Folia pedatim 5–7 partita.

79. M. aretioides A. Gray, *l. c.* p. 153; Wedd. *l. c.* p. 279.

Hab. Peru; Casa Cancha, *Pickering*!

*** Folia flabellatim vel pedatim laciniata vel inæqualiter 3-partita.

80. M. Orbignyanum Wedd. *l. c.* p. 279.

Hab. Bolivia; Lagunas de Potosi, *d'Orbigny*! Andahuaylas, *Pearce*! Sorata, *Mandon*!

B. Folia pinnatifido-incisa vel partita vel secta.

* Folia utrinque tomentosa.

81. M. Cavanillesii A. Gray, *l. c.* p. 156; Wedd. *l. c.* p. 281. *Sida acaulis* Cav.; DC. Prod. i. p. 466.

Hab. Peru; Casa Cancha, *Pickering*!

82. M. anthemidifolium A. Gray, *l. c.* p. 152; Wedd. *l. c.* p. 282. *Sida anthemidifolia* Remy in Ann. Sc. Nat. 3rd ser. vi. p. 356.

Hab. Peru; between Puno and Arequipa, *Weddell*. Bolivia, nr. Potosi and Oruro, *d'Orbigny*.

83. M. Castelnæanum Wedd. *l. c.* p. 283, tab. 80 A.

Hab. Peru; Cordilleras of Cusco, *F. de Castelnau, Gay*.

** Folia supra tomentosa subtus glabra vel glabriuscula.

84. M. Mandonianum Wedd. *l. c.* p. 282.

Hab. Bolivia; La Paz, Sorata, *Mandon*!

85. **M. Pearcei,** n. sp.—Acaule caudice crasso ligneo, foliis longe petiolatis pinnatisectis segmentis angustis interdum lobatis supra plus minusve albo-tomentosis subtus glabris, floribus fere

medio petioli insertis, calyce tubo campanulato dentibus triangularibus externe fere glabris interne albo-tomentosis, petalis calyce duplo longioribus cupreis vel roseis, carpellis villosis.

Hab. Bolivia; Andes of Yungas, 15–16,000 ft.; Andahuaylas, 13–14,000 ft., *R. Pearce*! Hb. Kew.

Root 2–3 in. long; leaf, lamina ¾ in., petiole 1–1½ in.; sepals ⅜ in.; petals ½ in. long.

86. M. STENOPETALUM A. Gray, *l. c.* p. 154; Wedd. *l. c.* p. 282.

Hab. Peru; Cordilleras, *Maclean*. Casa Cancha, *Pickering*!

87. M. PINNATUM A. Gray, *l. c.* p. 154; Wedd. *l. c.* p. 281. *Sida pinnata* Cav.; DC. Prod. i. p. 466.

Hab. Peru; Cuzco, *Gay*. Casa Cancha, *United States Explor. Exp.* Cerro Pasco, *Mathews*!

*** Folia supra glabra vel glabriuscula.

88. M. LONGIROSTRE Wedd. *l. c.* p. 281.

Hab. Peru: Cuzco, *F. de Castelnau*. Bolivia, La Paz, *Mandon*! Andes of Escomas, *Pearce*!

†† Caulescentia.

89. **M. auricomum** Philippi in Herb. Kew. ined.—Caulescens, radicibus fibrosis, foliis petiolatis limbo quam petiolo breviore inferne cuneato integro superne palmatim 5–7-lobatis albo-tomentosis lobis brevioribus oblongis ad extremites aureis petiolis non dilatatis, floribus solitariis ad imam petioli sessilibus, calyce globoso albo-tomentoso dentibus triangularibus subacuminatis ad extremites aureis.

Hab. Chili; Desert of Atacama. *R. A. Philippi*!

Stem 1 in.; leaf, petiole ⅓–½ in., lamina ¼ in.; calyx ¼ in.

A very distinct plant, easily recognised by the small lobes of the leaves, and the sepals being tipped by a golden cushion of hairs.

90. **M. Lobbii**, n. sp. — Caulescens totum albo-tomentosum, foliis petiolatis palmatisectis segmentis 2–3-lobis lobulis oblongis vel spathulatis obtusis, floribus solitariis circiter medio petiolo insertis, sepalis anguste lanceolatis obtusis, petalis sepalis valde longioribus oblanceolatis, carpellis dorso rotundatis hirtis.

Hab. Columbia, *Lobb*! Herb. Kew.

This and the preceding differ from all the other members of the section in having short creeping stems of 3–4 in. in length, and fibrous roots. The flowers, however, are solitary and subsessile on the petiole, which is not much dilated, and the white tomentum resembles that of *M. compactum*.

The following plants have been recently described in the *Flora Brasiliensis* by Dr. K. Schumann:—

M. GARCKEANUM K. Schum. in Mart. Fl. Bras., fasc. cix. p. 267, t. lii. f. 1.

Hab. Uruguay.

β. PARANENSIS K. Schum. *l. c.*

Hab. Fl. Parana, *Tweedie*.

M. INTERRUPTUM K. Schum. *l. c.* p. 272.
Hab. Argentine Republic, prov. Cordova; Santa Fé.

M. PENTANDRUM K. Schum. *l. c.* p. 273.
Hab. Argentine Republic.

M. DECIPIENS K. Schum. *l. c.* *Sida decipiens* St. Hil. et Naudin, Ann. des Sc. ii. ser. xvii. p. 54.
Hab. Brazil; Rio Grande do Sul. Uruguay.

M. NUDUM K. Schum. *l. c.* p. 274. *Malva purpurata* in Bot. Mag. t. 3814, non Lindl.
Hab. Uruguay. Argentine Republic.
This plant resembles *M. campanulatum* Nicholson.

Species exclusæ.

M. Coulteri S. Wats. = *Sphæralcea Coulteri* A. Gr.
M. grossulariæfolium A. Gr. = *Sphæralcea pedata* Torr.
M. heterophyllum Griseb. = *Sphæralcea heterophylla.*
M. linearifolium Buckley = *Sida ciliaris* L., var.
M. multiflorum Greene = *Sphæralcea.*
M. Munroanum A. Gr. = *Sphæralcea Munroana* Spach.
M. pedatifidum A. Gr. = *Sphæralcea pedatifida* A. Gr.
M. sulphureum Griseb. = *Sida sulphurea* A. Gr.

Non satis notæ.

M. glomeratum Griseb. in Goetl. Abhand. xxiv. p. 42.
M. linoide Hieron. in Bol. Act. Nat. Cordova, iii. p. 336.
M. tenellum Hieron. *l. c.* iv. p. 15.
M. violaceum Hieron. *l. c.* iv. p. 15.

(To be continued.)

NÄGELI.

CARL WILHELM VON NAGELI, whose death on the 10th of May, at the age of seventy-four, is the most serious loss which botanical science has recently sustained, was born on the 27th of March, 1817, at Kilchberg, near Zürich. He was the son of a country doctor, a man, as it appears, of some importance in his own neighbourhood. It was at first intended that the younger Nägeli should follow his father's profession, and with this view, when his school career was ended, he matriculated at the newly-founded University of Zürich. Here, however, his tastes were so strongly influenced in the direction of pure natural science, that all idea of his becoming a medical man was abandoned, and he migrated to Geneva with the resolution of studying under DeCandolle, and thus fitting himself for the career of a botanist.

Nägeli took his doctor's degree at his old University, Zürich, in 1840. The dissertation which he presented on that occasion was dedicated to the great palæontologist, Oswald Heer, and was on a purely systematic subject, namely, the Swiss species of the genus

Cirsium.* It is important to bear in mind that the minute work on species which began with this paper was continued throughout the whole of Nägeli's life, at the same time with those histological and physiological researches with which his name is more generally associated.

After studying for a short time in Berlin, he settled at Jena, and there, in company with Schleiden, his first histological work was carried on. His earliest paper of this character is on the development of pollen.† The copy of this paper which is in the possession of the Linnean Society was presented to Robert Brown, and is still accompanied by the letter written on that occasion by the young German histologist to the great English master.

In the following year a number of papers, mainly histological, were contributed by Nägeli to *Linnæa*.‡ Some of these are in defence of the then prevalent Schleidenian theory of free-cell formation.

During the years 1844–46 appeared the *Journal of Scientific Botany*,§ edited by Schleiden and Nägeli, but almost wholly the work of the latter. During its brief career this journal brought before the world an extraordinary series of important researches. Among the most valuable papers are the introductory one on the problems of Natural History; the histological papers on Nuclei and Cell-formation, which first established the general occurrence of divisions as the mode of origin of the nucleus of the cell;‖ the algological contributions on *Caulerpa prolifera*; on the growth of *Delesseria*; on *Polysiphoniæ* and *Herposiphoneæ*; the first discovery of spermatozoids in Ferns, the great anatomical treatise on the growth of the stem in vascular plants: the morphological researches on the growth of the *Muscineæ*; on the growth and definition of the leaf; and on the reproduction of the Rhizocarps.

In 1845, Nägeli married; on his wedding journey he was not idle, but spent a long time collecting sea-weeds on the S.W. coast of England. The material then acquired was utilised for his important work on the classification of Algæ.¶ In this work, full justice is done to the great English algologists of that time, and indeed Nägeli all through his life was fully in sympathy with English work. It is remarkable that Nägeli excluded the *Florideæ* from the Algæ, and included the Lichens. His general views on algological subjects were much vitiated by his preconception that all true Algæ are asexual, and by his misunderstanding of the reproductive processes in the red sea-weeds, in which he still

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* *Die Cirsien der Schweiz.* Schweizer Gesell. f. Naturwiss. Denkschriften, Band v. 1841.

† *Ueber die Entwicklung des Pollens.* Schweizer Gesell. Verhandlung, 1841.

‡ *Botanische Beiträge.* Linnæa. Band xvi. 1842.

§ *Zeitschrift für wissenschaftlich. Botanik Schleiden u. Nägeli*, 1844—6.

‖ These papers, as well as one on the utricular structure in the contents of cells, were translated by Henfrey, and appear in the Ray Society's Reports and Papers on Botany for 1845 and 1849.

¶ *Die neueren Algensysteme*, &c. Schweizer Gesells. f. Naturwiss. Denkschriften, Band ix. 1847.

persisted many years later, after his own observations might have put him on the right track. In spite of these drawbacks, an enormous amount of valuable algological work is embodied in this book, and in that on the unicellular Algæ which appeared two years later.*

Nägeli now began to take part in the University teaching of Botany, becoming first *Privat docent*, and afterwards Extraordinary Professor at Zürich.

In 1852 he returned to Germany as Professor of Botany at the University of Freiburg. Whilst holding this post, he carried out, in conjunction with Cramer, those famous researches which appeared under the name of *Pflanzenphysiologische Untersuchungen* in 1855–8. Of these, the most generally known is his great work on the Starch-grains, in which his theories of the growth and molecular structure of organised bodies were first given to the world. These theories mark an epoch in Physiology, though they have not stood the test of later investigations. Other researches of fundamental importance contained in this volume, and which are the direct work of Nägeli, are those on the primordial utricle, on diosmosis, on the development of vegetative organs of certain *Florideæ*, and on the development of the leaf in *Sphagnum* and in *Aralia*.

In 1855, Nägeli became Professor of General Botany at the new Polytechnik in Zürich; but he did not long remain in his native country, for in 1857 he was appointed to the important University Professorship at Munich, which he held till his death.

From 1858 to 1868 a new series of investigations appeared, largely the work of Nägeli himself, in the *Contributions to Scientific Botany*.† The first number of this publication contains his chief anatomical paper: on the growth of stem and root in vascular plants, and on the arrangement of vascular bundles—a work which still remains the chief authority on the general distribution of the vascular system in plants.

Passing over several interesting works, we may mention that the concluding number of the *Beiträge* iucludes two more anatomical masterpieces: the research on the growth in thickness of the *Sapindaceæ*, and that on the origin and growth of roots, published in conjunction with Leitgeb.

We may here cite one more anatomical work, which was published elsewhere during the same period,—that on the sieve-tubes of *Cucurbita*,‡—which is one of the most valuable of the earlier contributions to our knowledge of these important conducting organs.

The whole series of works belonging to this period stand in relation to the views brought forward in the book on starch-grains.

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* *Die Gattungen einzelliger Algen.* Schweizer Gesells. Naturwiss. Denkschrift. 1849.

† *Beiträge zur Wiss. Botanik*, 1858—68.

‡ *Ueber die Siebröhren von Cucurbita Sitzungsberichte der Münch. Akademie.* 1861.

The titles of some of these are cited below.* To the same period belongs an algological work of interest, that on the *Ceramiaceæ*,† in which the female organs are first described and figured, though, unfortunately, Nägeli completely failed to understand their function.

In the meantime Nägeli was also continuing those researches on variable species which he had commenced on the very outset of his career. The long series of papers on the genus *Hieracium*, some of which are cited below, culminated towards the close of his life in the work on the *Hieracia*‡ of Central Europe, published in conjunction with Peter. This systematic work was an invaluable preparation for the treatment of the great subjects of heredity and evolution, in the light of Darwin's work. Nägeli's views on the whole question were first expressed in an admirable paper on the origin and idea of the species in Natural History.§ In this paper, the general doctrine of the origin of species by descent and Darwin's special theory of natural selection are brilliantly explained, but Nägeli also takes up an independent position. He believed, both at that time and throughout the rest of his life, that the most important characters by which the groups of plants and animals are distinguished are purely morphological, and not of the nature of adaptations. Hence it appeared to him that natural selection was an insufficient explanation of the facts. He held the theory that all organized beings varied in the direction of greater complexity and perfection, and that this predestined course of development accounted for the main lines which evolution has taken. Though this view is open to the gravest objection, to Nägeli belongs the credit of having first clearly shown that the causes of variability must be internal to the organism. This paper is the first of a whole series dealing with the subjects of Variation, Hybridisation, and the Origin of Species.‖

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* *Verhalter des polarisirten Lichtes gegen pflanzliche Organization.* München, Sitzungsberichte, 1862. *Ueber crystallähnliche Proteinkörper*, Do., 1862. *Reaction von Jod auf Stärkekörner u. Zellmembranen*, Do., 1862 & 3. *Ueber die chemische Zusammensetzung der Stärkekörner u. Zellmembranen*, Do. *Ueber die chemische Verschiedenheit der Stärkekörner*, Do., 1863. *Ueber den inneren Bau der vegetabilischen Zellenmembranen*, Do., 1864. See also Nägeli und Schwendener, *Das Microscop*, 1877, of which a translation into English has been published.

† *Beiträge zur Morphologie u. Systematik der Ceramiaceæ.* München, Sitzungsberichte, 1861.

‡ *Ueber einige Arten der Gattung Hieracium*, Zeitschrift für wiss. Bot., 1845. *Ueber die Innovation bei den Hieracien*, München, Sitzungsberichte, 1866. *Ueber die systematische Behandlung der Hieracien*, Do. *Ueber die Synonomie und literatur der Hieracien*, Do. *Ueber die Piloselloiden*, Do., 1867. *Ueber die Piloselliformia*, Do. *Die Hieracien Mitteleuropas. Nägeli u. Peter*, 1885, &c. There are also many other papers bearing on the subject.

§ *Ueber die Entstehung und Begriff der Naturhistorischen Art.* München, Sitzungsberichte, 1865.

‖ *Ueber den Einfluss äuserer Verhältnisse auf die Varietätenbildung im Pflanzenreiche*, München, Akad. Sitzungsberichte, 1865. *Ueber die Bedingungen des Vorkommens von Arten und Varietäten, &c.*, Do., 1865. *Die Bastardbildung im Pflanzenreich*, Do., 1865. *Ueber die abgeleiteten Pflanzenbastarde*, Do., 1866. *Die Theorie der Bastardbildung*, Do., 1866. *Ueber die Zwischenformen zwischen den Pflanzenarten*, Do., 1866.

His greatest and final work on the subject is the *Mechanisch-physiologische Theorie der Abstammungslehre*, 1884, in which the views above sketched received their full development, and in which is brought forward for the first time that theory of the idioplasm which forms the basis of so much recent work on heredity.

In addition to the lines of investigation already referred to, Nägeli made important contributions to our knowledge of the lower Fungi,* and of the process of fermentation. He is also the author of various papers on scientific or philosophical subjects quite distinct from Botany. It would be inappropriate to cite these here, but they afford an interesting indication of the many-sided character of his intellect.

During the last half-century the science of Botany has advanced as it never advanced before, and to this progress no one man has contributed more than Carl von Nägeli. We trust that his work may be worthily continued in the hands of his distinguished successor in the Munich post, Dr. Karl Goebel.

D. H. Scott.

REPORT OF DEPARTMENT OF BOTANY, BRITISH MUSEUM, 1890.

By William Carruthers, F.R.S.

During the year, 42,646 specimens have been mounted, named, and inserted in their places in the Herbarium. These have consisted principally of plants from Greece, collected by Heldreich; from the Caucasus, by Brotherus; from Syria, by Post; from India, by Beddome: from Penang, by Curtis; from Malaya, by King; from China, by Hance; from Japan, by Maximowicz; from Natal, by Clarke; from Madagascar, by Scott Elliot; from Canada, by Macoun; from Mexico, by Pringle; from British Guiana, by Jenman; from South America, by Miers and Pearce; from Fernando de Noronha, by Ridley; and from the Sandwich Islands, by Hillebrand.

In the progress of incorporating these additions, the following Natural Orders have been more or less completely re-arranged:—*Malvaceæ*, *Leguminosæ*, *Valerianaceæ*, *Aristolochiaceæ*, *Dipsaceæ*, *Apocynaceæ*, *Acanthaceæ*, *Chenopodiaceæ*, *Juncaceæ*, *Cyperaceæ*, and *Gramineæ*.

A considerable portion of the Fungi has been arranged and named according to Saccardo's *Sylloge Fungorum*, and numerous specimens of Algæ, Mosses, and Lichens have been incorporated with the Herbarium.

The revision of the specimens and illustrations of the Natural Orders of Plants in the Public Gallery has been continued, and a complete series of the British Mosses, with coloured drawings of the Genera, has been added to the exhibited collection of British Plants.

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* *Die niederen Pilze*, 1877. *Theorie der Jährung*, 1872.

The principal additions to the Herbarium during the year have been the acquisition of the collections formed by the late Dr. R. McCormick, R.N., consisting of plants from Spitzbergen, collected in the expedition to the Arctic Regions, under Captain Parry, in 1827; of those obtained in the voyage of the 'Erebus' and 'Terror,' in the South Polar Seas, under Sir James Clark Ross, at Madeira in October 1839, the Cape de Verdes in November 1839, Trinidad in December 1839, St. Helena in February 1840, Cape of Good Hope in March 1840, Tasmania in August 1840, Auckland and Campbell Islands in December 1840, New Zealand in August 1841, Falkland Islands in April 1842, Hermite Island in November 1842, and in Ascension Island in May 1843; and in the expedition in search of Sir John Franklin, at Disco, in June 1852, and at Caswell's Tower in July 1853.

A great series of microscopic slides, amounting to 3137, formed by the late John Ralfs, M.R.C.S., author of *The British Desmidieæ*, was presented by his son, Mr. J. W. Ralfs, of Liverpool. They consist of specimens of *Desmidieæ*, *Diatomaceæ*, and other *Algæ*, and contain the types of his own species, as far as they were in his possession.

The Museum has acquired the scientific correspondence of the late Rev. M. J. Berkeley, F.R.S., containing letters from the most distinguished fungologists of his day, and including those of Mr. C. E. Broome, in reply to his own letters already in the Department of Botany. These two series of letters are of much importance, as they refer to specimens in Mr. Broome's great Herbarium, which was bequeathed to the Trustees and received four years ago.

The additions to the collections by presentation during the year have consisted of 26 Chinese plants from Mr. T. Sampson; 17 New Guinea plants, and 675 Australian plants, from Baron F. von Mueller; specimen of a *Myrmecodia*, from Prof. Haddon, Dublin; 384 plants from British Guiana, from Mr. G. S. Jenman; 375 Indian plants from Dr. G. King; 590 plants from Mr. H. N. Ridley, Singapore; a collection of plants from the Victorian Government; 118 plants from Madagascar, from Mr. G. F. Scott Elliot; 109 New South Wales plants from Rev. J. Lamont; 87 plants from Dominica, from the West Indian Exploration Committee; 38 plants from the High Andes, presented by Mr. E. Whymper; 26 Indian plants from Mr. C. B. Clarke; 26 Orchids from Mr. H. J. Veitch; a collection of Assam Ferns from Mr. C. W. Hope; and specimens from Messrs. H. Feer, F. W. Styan, T. D. A. Cockerell, T. Harcourt Powell, and C. Bicknell; 157 woods and 42 seeds from Victoria, from the Victorian Government; the woody portion of the stem of a Cactus from California, from Mr. O. H. Howarth; fruits of *Monstera*, from Lady Theodora Guest; and cones of *Araucaria imbricata*, from Mr. T. Harcourt Powell.

260 cellular Cryptogams collected on his various expeditions, by Dr. McCormick, R.N., and bequeathed by him; 92 species of cellular plants from the Andes, collected and presented by Mr. E. Whymper; 40 species of cellular plants from New Zealand, from Miss Rye; 39 species of cellular plants from Singapore, presented

by Mr. H. N. Ridley; specimens of cellular plants from Rev. H. G. Jameson, Mr. H. W. Monington, Mr. C. H. Wright, Mr. W. H. Pearson, Mr. W. H. Paterson, Rev. E. S. Marshall, Mr. A. W. Bennett, Mr. Charles Whatmore, Prof. Harvey Gibson, Mr. George Massee, Mr. T. D. A. Cockerell, Mr. E. A. L. Batters, Dr. Wilson Barker, and Prof. Johnson; 16 Australian Algæ from Mr. C. Hampden Wigram; 110 Australian Algæ from Mr. George Clifton, R.N.; 138 Australian Algæ, collected by Mr. Bracebridge Wilson, from Baron Ferdinand von Mueller; 6 species of Algæ from Port Elizabeth, from Mr. H. A. Spencer; 221 specimens of Algæ from the Cape of Good Hope, collected and presented by Mr. Leonard A. Boodle; 53 British Fungi, presented by Mr. Horatio Piggot; 30 slides of Indian Uredineæ, and two Fungi from Simla, from Dr. A. Barclay.

Among the additions to the British Herbarium are:—209 specimens from the Rev. E. S. Marshall; 410 specimens from the Rev. T. S. Lea; 53 specimens from Mr. John Benbow; 32 specimens from Mr. W. H. Beeby; 37 specimens from the late Mr. T. R. Archer Briggs; 11 specimens from Mr. R. W. Scully; and others from Misses R. F. and F. P. Thompson, Messrs. F. J. Hanbury, W. Whitwell, and F. C. S. Roper; and an important collection of fruits and seeds from Mr. Clement Reid.

The following collections have been acquired by exchange:—179 of Schweinfurth's Arabian plants; 452 Sandwich Islands plants from Hillebrand; 467 Japanese plants from the St. Petersburg Herbarium; 224 of Schimper's Abyssinian plants from the Berlin Herbarium; 10 American *Malvaceæ* from J. N. Rose; *Delesseria amboinensis* from Count Solms Laubach.

The following collections have been acquired by purchase:—194 plants from Honduras, collected by the Rev. J. Robertson; 113 Natal plants from Mrs. C. S. Clarke; 300 Hieracia of Scandinavia, from H. Dahlstedt; 358 Mexican plants, from C. S. Pringle; 469 Asia Minor plants, from Bornmüller; 243 Penang plants, from C. Curtis; 706 *Cyperaceæ* and *Gramineæ*, from Col. Beddome; 25 specimens of *Erythræa*, from Wittrock; 111 specimens of Natal plants, from J. M. Wood; 603 Bolivian plants, from H. H. Rusby; 526 Syrian plants, from G. E. Post; 1975 plants from the Republic of Columbia, collected by F. J. Lehmann; 320 Greek plants, from Orphanides; 8 *Muscineæ*, 15 lichens, and 132 fungi from Tonkin, collected by Balansa; 106 specimens of South African Hepaticæ, collected by Rehmann; 74 British Hepaticæ from Carrington and Pearson; 1287 lichens from Rev. J. M. Crombie; 100 Algæ from Hauck and Richter; 11 preparations of North American Diatomaceæ; 25 British Algæ, from E. M. Holmes; 106 slides of Algæ, from T. B. Buffham; 500 Fungi, from Sydow; 66 Fungi from the island of St. Thomas, Gulf of Guinea; 100 European Fungi, from Winter; and 90 Fungi from the Orinoco, collected by A. Gaillard.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Concluded from p. 344.)

Wilson, John (d. 1751); b. Kendal, Westmoreland; d. same place ?, 15th July, 1751. Shoemaker and baker. Of Kendal. 'Synopsis of Brit. Pl.,' 1744. Pult. ii. 264; Pritz. 348; Jacks. 232; Cash, 7; Nicholson, 'Annals of Kendal,' 343. *Wilsonia* Br.

Wilson, R. (fl. 1800). Of Medomsley, Durham. Sent drawings of Fungi to Winch. Winch, Bot. Guide, ii. i.

Wilson, William (1799–1871): b. Warrington, 7th June, 1799; d. Paddington, nr. Warrington, 3rd April, 1871; bur. Non-conformist burial-ground, Hill Cliff, Warrington. 'Bryologia Britannica,' 1855. Described *Cotoneaster* for E. B. S. 2713, and Mosses for 'Flora Antarctica,' 'Bot. Herald,' &c. E. Bot. 2664, 2723; Pritz. 348; Jacks. 621; R. S. C. vi. 389; viii. 1249; Gard. Chron. 1871, 554; Cash, 145; Journ. Bot. 1871, 159; Trans. B. S. Ed. xi. 171. Photo. at Kew. Herbarium and correspondence in Hb. Mus. Brit. *Wilsonia* Gill. & Hook. = *Dipyrena*.

Winch, Nathaniel John (1769 ?–1838): b. 1769 ?; d. Newcastle, 5th May, 1838. F.L.S., 1803. A.L.S., 1821. 'Bot. Guide to Northumb. and Durham,' 1807. 'Geog. distrib. of pl. through Northumb., 1819; ed. 2, 1825. MSS. and herbarium of 12,000 spp. left to Linn. Soc., and given by them to Nat. Hist. Soc. of Northumb. and Durham. Contrib. Mosses to E. Bot. (1218, 1945). Discovered *Pyrola media* in Britain. Mag. Zool. Bot. i. (1838), 415; Mag. Nat. Hist. 1830: Pritz. 348; Jacks. 621; R. S. C. vi. 392. Portr. at Kew. *Winchia* A. DC.

Windsor, John (1787–1868): b. Settle, 1787; d. Manchester, 1st Sept. 1868. F.L.S., 1814. Surgeon. 'Thlaspi alpestre,' Journ. Linn. Soc. x. 196. 'Settle Plants' in Phyt. 1855–8. 'Flora Cravoniensis' (posth.), 1873. Had a herbarium. E. Bot. 2211; Pref. to Fl. Cravoniensis; Proc. Linn. Soc. 1868–9, cxx; Jacks. 250; R. S. C. vi. 395; viii. 1251. *Windsoria* Mitt.

Winterbottom, James Edward (1803–1854): b. Reading, 7th April, 1803; d. Rhodes, 4th July, 1854. M.A., 1828. M.B., 1833. F.L.S., 1830. Collected in Himalayas and Tibet, with Strachey, 1848–9. Plants at Kew, &c. Proc. Linn. Soc. ii. 418; Journ. Bot. 1854, 307, 345; Fl. Indica, i. 65.

Witham, Henry T. M. (fl. 1831–1833). Of Edinburgh? 'Observations on structure of fossil vegetables,' 1831. Pritz. 350; Jacks. 621; R. S. C. vi. 404.

Withering, William (1741–99): b. Wellington, Salop, 28th March, 1741; d. Birmingham, 6th Oct. 1799; bur. Edgbaston. M.D., Edinb., 1766. F.R.S. F.L.S., 1791. Practised at Stafford, and afterwards at Birmingham. 'Systematic Arrangement of Brit. Pl.,' 1776. Pritz. 350; Jacks. 621; Cott. Gard. vii. 43; Gard. Mag.

iv. 536; Phil. Trans. xv.; Colvile, 'Worthies of Warwickshire,' 837; 'Miscellaneous Tracts,' with memoir by his son. Portr. in Thornton. Copy at Kew. *Witheringia* L'Hérit.

Withering, William (d. 1832): d. London, 1832. Of Birmingham. F.L.S., 1801. Son of the preceding. Edited 4th, 5th, and 6th ed. of his father's 'Arrangement,' and his 'Miscellaneous Tracts.' Pritz. 350; Jacks. 234.

Withers, Robert (d. 1856). Of Bath. '*Scirpus Savii*,' &c., Phyt. iii. 865. Had a British Herbarium, especially of Bath plants. R. S. C. vi. 404.

Wonfor, Thomas W. (1827?–78): d. Brighton, 20th Oct. 1878, F.L.S., 1877. Hon. Sec. Brighton and Sussex Nat. Hist. Soc., 1853–78. Microscopist. 'Naturalist,' iv. 75 (1878–9); R. S. C. viii. 1266.

Wood, Rev. Henry Hayton (1825–82): b. Westward, Cumberland, 28th Sept. 1825; d. same place, 3rd Nov. 1882. M.A., Oxon, 1851. Rector of Holwell, Dorset, 1857. Bryologist. One of founders of Dorset Field Club. Moss herbarium in Brit. Mus. Journ. Bot. 1883, 380.

Wood, John Bland (1813–90): b. Pontefract, 3rd Dec. 1813; d. Withington, Manchester, 11th Feb. 1890. M.D. Muscologist. Employed R. Buxton as collector. Letters in Wilson's correspondence. 'Flora Mancuniensis,' 1840. Pritz. 351; Jacks. 256; R. S. C. vi. 433; Journ. Bot. 1890, 86.

Wood, Mary Bristow (fl. 1845–9). 'Botanical Researches,' 1849.

Wood, Robert (fl. 1723). Curator, Edinburgh Physic Garden, 1723. Made large collection of seeds and seed-vessels of plants. Rich. Corr. 201.

Wood, Rev. Robert (1796–1883): b. Tallentire, Cockermouth, 18th Dec. 1796; d. Westward, Wigton, 15th March, 1883. Incumbent of Westward, 1822–83. Father of H. H. Wood. '*Alchemilla conjuncta*,' Journ. Bot. 1872, 308. Had a herbarium. Journ. Bot. 1883, 380; R. S. C. viii. 1268.

Wood, Rev. William (1745–1808): b. Collingtree, Northants., 29th May, 1745; d. Leeds, 1st April, 1808. B.D. F.L.S., 1791. Succeeded Priestley at Mill Hill Chapel, Leeds, 1773. Correspondent of Withering. Contributed botanical articles to Rees up to letter C, to Withering, ed. 2, and to E. Bot. (57–775). Smith, Letters, i. 488; Memoirs by C. Wellbeloved, 1809, with portr.; Taylor, 'Leeds Worthies,' 232; Mag. Zool. Bot. ii. 271; Salisbury, Gen. Pl. 6.

Woodforde, James (d. 1837): d. Castle Carey, Somerset, 6th July, 1837. Of Castle Carey. M.D., Edinb., 1825. F.L.S., 1826. 'Cat. of pl. in Edinburgh,' 1824. Pritz. 351; Jacks. 252; Mag. Zool. Bot. ii. (1838), 386.

Woods, Joseph (1776–1864): b. Stoke Newington, 24th Aug. 1776; d. Lewes, 9th Jan. 1864. Of Lewes. Architect. F.L.S., 1801. 'Fedia,' Linn. Trans. 1835. 'Bot. Excursion in N. of England,' Comp. Bot. Mag. i. 288. 'Tourists' Flora,' 1850. Discovered *Lotus hispidus* in Britain, 1828, and *Eriophorum gracile* in 1825. Contrib. to E. Bot. 1301, 2823, 2886.

Herbarium in possession of F. Townsend. Pritz. 351; Jacks. 622; 'Bot. Guide,' xiv.; Proc. Linn. Soc. 1863–4, xxxii.; Journ. Bot. 1864, 62; R. S. C. vi. 436. Engr. portr. by Cotman, 1822, at Linn. Soc. *Woodsia* Br.

Woods, Rev. Julian Edmund Tenison- (1832–1889): b. London, 15th Nov. 1832; d. Sydney, 7th Oct. 1889. F.L.S., 1863. Went to Tasmania, 1855. Ordained priest, 1857. To Singapore, 1883. President Linn. Soc. N.S.W., 1880–81. Bot. papers in Proc. Linn. Soc. N.S.W. Jacks. 622; R. S. C. vi. 436; viii. 1270; Geol. Mag. 1890, 288; Proc. Linn. Soc. N.S.W., 2nd Ser. iv. 1301, with bibliography.

Woodville, William (1748?–1805): b. Cockermouth, Cumberland, 1748? or 1752; d. London, 26th March, 1805; bur. Bunhill Fields. M.D. Edinb. 1775. L.R.C.P., 1784. F.L.S., 1791. Physician to Small-pox Hospital, King's Cross, where he had a bot. garden. 'Medical Botany,' 1790–4; ed. 3, 1832. Pritz. 351; Jacks. 201; Munk, ii. 345; Michaud; Hoefer. Engr. portr. by Bond, from portr. by Abbot, at Small-pox Hospital. Copy at Kew. *Woodvillea* DC.

Woodward, John (1665–1728); b. Derbyshire, 1st May, 1665; d. Gresham College, 25th April, 1728; bur. Westminster Abbey. M.D., Cantuar., 1695, and Camb., 1696. F.R.S., 1693. F.R.C.P., 1703. Prof. Physic, Gresham College, 1692. 'Insignis Botanicus,' Pluk. Mant. 168. 'Thoughts and experiments on vegetation,' Phil. Trans. xxi. 193. Herbarium. 'Life and letters of Sedgwick' (1890), i. pp. 166–187, with portr. after oil-painting in Woodwardian Museum.

Woodward, Samuel Pickworth (1821–65): b. Norwich, 17th Sept. 1821; d. Herne Bay, Kent, 11th July, 1865; bur. Highgate Cemetery. A.L.S., 1842. Prof. Nat. Hist., Cirencester. Memb. Bot. Soc. Lond., 1839. Malacologist. 'Flora of Central Norfolk,' Mag. Zool. Bot. v. (1841), 201. Herbarium and drawings at Roy. Agric. Coll., Cirencester. Proc. Linn. Soc. 1865–6, lxxxvi.; Journ. Bot. 1865, 264: R. S. C. vi. 437; viii. 1273; Trans. Norf. Nat. Soc. iii. 279, with portrait. *Carduus Woodwardii* Wats.

Woodward, Thomas Jenkinson (c. 1745–1820): b. 1745?; d. Diss, Norfolk, 28th Jan. 1820. Of Bungay. LL.B., Camb., 1769. F.L.S., 1789. 'British Fuci' (with Goodenough), 1793. Contributed to Martyn's Miller, and (largely) to Withering, ed. 2; also to E. Bot. 151–920. Fl. Suffolk, 481; Linn. Trans. i.–iii.; Phil. Trans. lxxi. 222. Rees; R. S. C. vi. 438; Gent. Mag. 1820, i. 189. *Woodwardia* Sm.

Woollgar, Thomas (fl. 1800). Of Lewes. Contrib. localities to Milne & Gordon's 'Indigenous Bot.' (pref. viii.). Borrer's "earliest assistant in botany." Studied willows, and sent them to E. Bot. 1436, 1936–7, 2651. *Salix Woollgariana* Borr.

Wooster, David (1824?–88): d. Bayswater, Sept. 1888. Assisted J. C. Loudon in his works. 'Alpine Plants,' 1872–4. Jacks. 622; Gard. Chron. 1888, iv. 393.

Wootton, —. (fl. 1538). W. Turner, 'Libellus.' Jacks. xxx.

Worsley, Anna (*see* RUSSELL).

Wright, Charles H. (fl. 1844). Guide to Lakes. Phyt. ii. 428; E. Bot. 2893.

Wright, Francis Bowcher (fl. 1803). Of Paulton, Somerset. F.L.S., 1808. Discovered *Pæonia* at Steep Holmes, 1803. E. Bot. 1513, 1657.

Wright, William (1735–1819): b. Crieff, Perthsh., March, 1735; d. Edinburgh, 19th Sept. 1819; bur. Greyfriars, Edinb. M.D., St. Andrew's. A.L.S., 1807. F.R.C.P.E., 1782. F.R.S.E., 1788. F.R.S. Went to Greenland, 1757; Jamaica, 1765–77, and 1779–85. Discovered *Cinchona Jamaicensis*, Phil. Trans. lxvii. 504. Jamaica plants in Herb. Liverpool Bot. Garden. 'Memoirs,' with portr., 1828; Nich. Illustr. iii. 781; Turn. Fuci, iii. 32; Naturalist, iv. 399 (1839); Pritz. 351; Jacks.; R. S. C. vi. 446. Portr. engr. by Lizars from miniature by Caldwell. *Wrightea* Roxb. = *Wallichia*. *Wrightia* R. Br.

Wyatt, Mrs. Mary (fl. 1833). Dealer in shells, Torquay. 'Algæ Damnonienses,' 1833, superintended by Mrs. Griffiths. Mag. Nat. Hist. 1834, 95. *Wyattia* Trevisan = *Chlorosiphon* Kütz.

Wyburd, H. (fl. 1810). 'Introd. to Linnean Classification,' 1810. Jacks. 17.

Yalden, —. (fl. circ. 1750). Studied medicine in Edinburgh. Sent list of Edinburgh pl. to Lightfoot. Herbarium bequeathed to Lightfoot. MS. on Scottish plants in Bot. Dept., Brit. Mus. Fl. Scot. xiv.

Yates, Rev. James (1789–1871): b. Toxteth Park, Liverpool, April 30th, 1789; d. Highgate, 7th May, 1871; bur. Highgate Cemetery. Unitarian minister. M.A., Edinb., 1812. F.L.S., 1822. F.R.S., 1839. 'Fossil Cycads,' Proc. Yorksh. Phil. Soc. 1849, 37. Had a collection of Cycads. Pritz. 352; Proc. Roy. Soc. xx. i.; R. S. C. vi. 465; Gard. Chron. 1871, 618. *Yatesia*.

Yonge, Rev. James (1748–97). Of Puslinch, nr. Plymouth. Rector of Newton Ferrers. Contributed to plant-lists in Polwhele's Hist. Devon. Herbarium now at Puslinch. Briggs, 'Fl. Plymouth,' xxix.

Young, Edward (fl. 1856). Of Waincyrch, Neath. 'Ferns of Wales,' 1856, with dried specimens. Pritz. 352; Jacks. 247.

Young, George (fl. 1753–74). M.D. Surgeon to forces in West Indies. First Curator, St. Vincent Bot. Gard., 1765–1774).

Young, James Forbes (1796–1860): b. April, 1796; d. Lambeth, 30th June, 1860; bur. Lambeth Churchyard. M.D., Edinb., 1817. F.L.S., 1847. Of Lambeth. Herbarium in Herb. Mus. Brit. Proc. Linn. Soc. 1860–1, xlv.; Fl. Midd. 400.

Young, Rev. John (fl. 1829–59). M.A. 'Trees and Flowers in Scripture,' 1848. Jacks. 20.

Young, William Weston (d. 1898 or 1839). A.L.S., 1806. Made drawings for Dillwyn's 'Confervæ.' Proc. Linn. Soc. i. 36.

Yule, John (fl. 1808–25). M.D. Memb. Wern. Soc. 'Germination of Gramineæ,' Mem. Wern. Soc. i. 587. 'Coniferæ,' Edinb. Phil. Journ. i. 1819, 315; R. S. C. vi. 473.

Zier, John (d. 1796); b. Poland; d. London, 1796. F.L.S., 1788. Lived in London. Friend of Ehrhart. Wrote many of the descriptions in Dickson's Fasciculi of Cryptogamic Plants. MSS. in Herb. Mus. Brit. Rees; Linn. Trans. v. 4, 216; Bot. Mag. 1395; Journ. Bot. 1886, 101. *Zieria* Sm.

Zouch, Edward, 11th Baron (d. 1625). Studied bot. and had bot. garden at Hackney, under Lobel's care. Loudon, Encycl. Gard. 275.

SHORT NOTES.

Flora of Howth.—Since the publication of the volume bearing the above title in 1887, I have received notes of a few additions through the kindness of a friend:—*Euphorbia portlandica*. Found on Ireland's Eye in July by Sir Robert Ball, F.R.S. This species confirms Wade's old record (*Plantæ Rariores*), which I had omitted to mention in my Appendix I.—**Urtica pilulifera*. "It grows by a ruined cottage on the edge of the northern cliff near Bailey Lighthouse," Belfast, *R. Lloyd Praeger*: but this species is not native in Ireland. — *Festuca uniglumis*. "I was fortunate enough to find it on the coast, on the edge of the sand and grass from near the station to the point, that is, on the western edge," *H. C. Levinge* (who enclosed specimens). I may also mention that *Anemone nemorosa* is, I am informed, decidedly scarcer than I supposed it to be. As I am now very rarely at Howth, I have no means of verifying this.—H. C. Hart.

Acer campestre L.—In the 8th edition of the *London Catalogue* this plant is credited with a var. b. *hebecarpum* DC., which is described in DC. *Prodromus*, vol. i. 594, as "fructibus velutino-pubescentibus = *A. campestre* Wallr. in litt." A second form, also defined there, is "Var. b. *collinum* Wallr.! in litt., fructibus glabris," &c. Boenninghausen, in the *Prodromus Floræ Monasteriensis* (p. 116), in the same year (1824), distinguishes a variety which he called *pubescens*, which seems identical with the var. *lasiocarpa* of Wimmer and Grabowski in the *Flora Silesiæ* i. 363 (1827). The description in the *Species Plantarum* or *Flora Suecica* does not help us to decide which of these two varieties is the type of Linnæus; but I have recently examined the specimen in the Linnean Herbarium, and find it to be the form with pubescent samaras, *i. e.*, the var. *hebecarpum* of DC. This is much the commoner form in Oxon, Berks, and Northants, but I have also found the plant with glabrous samaras both in Oxon and Berks. These were gathered as late as October, and occurred with the var. *hebecarpum*, so that the hairs are evidently not very deciduous, nor is their occurrence due to soil or climate. This latter variety, as being the only one represented in the Linnean Herbarium, must be considered the type. If it be necessary to distinguish the glabrous fruited form, we may adopt the name given in the *Prodromus*, i. e., *A. campestre* L., var. *collinum* Wallr.—G. C. Druce.

NOTICES OF BOOKS.

British Fungi.

Outlines of British Fungology. Supplement. By Worthington G. Smith. (L. Reeve: 1891). 8vo, pp. xii. 386. Price 12s.

British Fungi. Phycomycetes and Ustilagineæ. By George Massee. (L. Reeve: 1891). 8vo, pp. xv. 232, 8 plates. Price

British Edible Fungi. By M. C. Cooke. (Kegan Paul & Co.: 1891). 8vo, pp. 237, 12 plates. Price 6s.

At this time of year it is only reasonable that we should expect the appearance of new books on Fungi; and the three titles cited above show that this anticipation has been amply fulfilled. There is certainly no other branch of Botany so fertile in the matter of books. Students of Algæ subsist on papers and lists of species for the most part (and these are increasingly numerous), but the mycologist has a library of books at hand.

Mr. Worthington Smith's volume is most heartily welcome. It was a happy thought to bring up to date that old-established favourite, Berkeley's *Outlines*, the very book of which students of Fungi have the most pleasant memories. To no one living could this task have fallen more appropriately than to Mr. Smith, whose best work has been done in this group, and whose admirable illustrations have delighted so many students. The additional species recorded since the *Outlines* appeared are more than as many again, and Mr. Smith's volume in point of fact attains the position of an independent work. His plan, which has been most ingeniously conceived, suits possessors of the *Outlines* exactly, and does not neglect the interests of others. All these additional forms are here recorded and described, and those which are to be found in the *Outlines* are cited in order without description, but with a reference to the page at which they are to be found in the *Outlines*. This plan makes the present volume the working one, and the *Outlines* remains for reference. A feature of value to Londoners is the citation of the Epping Forest species. If it were not presumptuous on my part, I should like to say how thoroughly this has been done, but Mr. Smith's reputation as an authority on the larger Fungi is so far beyond the reach of my praise or blame that readers will appreciate my reasons for refraining. It may be mentioned here that the great work on which Mr. Smith is now engaged by the Trustees of the British Museum, *viz.*, the illustration of every British species of the Basidiomycetes, for exhibition in the gallery of the Department of Botany, is already well advanced, and students of Fungi may confidently look forward to the enjoyment of this boon at an early date.

Mr. Massee's volume supplements Mr. Smith's so well that their authors might have been working in collusion. It includes groups of great interest to the microscopist, and his treatment of the Phycomycetes is especially valuable. His volume is prefaced by an

introduction to the study of Fungi, dealing with their morphology, distribution, collection, preservation, and methods of examination, with a section on classification. Especially in this portion Mr. Massee speaks out the faith that is in him (pp. 64 and 65), and I heartily endorse his sturdy criticism of the sloth of the "modern school" in its assumption that because the great founder of it, De Bary, demonstrated the life-histories of certain forms, we should quietly accept the position that the other species may be ranked along with them on evidence such as De Bary himself would have spurned. Mr. Massee's excellent plates and good descriptions are a welcome addition to our literature, and the present writer can say nothing more significant of his opinion than that mycology will be well served by further volumes dealing with the remaining groups, especially the Ascomycetes.

One cannot help looking somewhat askance at books on Edible Fungi. Books on poisonous Fungi one can understand, and likewise volumes on indigestible Fungi with an appendix containing an account of the few forms that are not only edible, but good to eat. Tastes and digestions are well known to differ. I knew a man who preferred weevils in his biscuits, and of these such as were both long and fat. Dr. Cooke is one of those enthusiasts who have eaten all sorts and conditions of Fungi, and he lives to tell the tale in a brightly-coloured little book. As has just been said, tastes differ, but I cannot help wondering why Dr. Cooke has never tried the common mushroom. He gives a list in his book, in which those Fungi he has eaten are marked with an asterisk; and the common mushroom, it seems, is among those the veteran has either despised or not found. This is a pleasure yet in store for him. It is well to have a guide of experience in these matters, and Dr. Cooke would have done still better than he has done, I venture to think, if he had included notice of the deadly sorts for contrast, as in Mr. Worthington Smith's well-known and useful *Mushrooms and Toadstools*. It would have been a great convenience for those who are to use this book if names had been given to the figures on the plates, since these occur in no particular sequence, and without reference to the adjoining letterpress. In a number of cases, such as Plate III., fig. 11 (*A. gambosus*), and Plate IV., figs. 12–14, there ought to have been sections, but this want is particularly to be noted in the case of *Marasmius oreades*. A good section would help to distinguish it from *M. urens*, which, the late M. J. Berkeley tells us, possesses "highly acrid qualities," and "sometimes accompanies it" (*Outlines*, p. 61). In view of the fact that this book will be used by the public, rather than by botanical experts, every aid to identification and every reasonable warning should be carefully included. Why leave the question open as regards such filth as *Lactarius piperatus* and *L. controversus?* They appear without an asterisk in the list at the end, but, though Dr. Cooke has not eaten them himself, it would surely not have been difficult for him to discover that both are horribly pungent when uncooked, and that the latter is almost wooden in consistency. Yet Dr. Cooke is content to say of *L. controversus* that it is "rather deficient in

aroma and flavour." The remarks on pp. 88 and 89, as to these two species, are by no means adequate. He says of *L. piperatus* that "the evidence is very strong that this suspicion is one of our insular prejudices." This particular prejudice would become a healthy one after trial of the matter.

Under *Agaricus ostreatus*, Dr. Cooke says he cannot detect the *taste* of the oyster. This is not astonishing to those who believe that the name has reference to the shape and colour of the pileus, which resemble an oyster-shell. *A. giganteus* and *A. maximus* are recommended, but this should be taken together with the fact that the recommendation is not after personal experience. Even if they had been asterisked, there would have been ground for hesitation in the fact that Dr. Cooke has wrongly named them in his *Illustrations* (see Plate 135, where *A. giganteus* is figured under the name of *A. maximus*, and Plate 106, where a *Paxillus* is figured under the name of *A. giganteus*. Enough has surely been said to show—it would be easy to say more—that this effort of Dr. Cooke's is not free from blemish. The book bristles with slipshod writing, and the botany frequently matches it. It would have been perfectly easy for an authority of Dr. Cooke's experience in these matters to write a really sound book on this subject, and it must be regretted that he has fallen short of this standard. G. M.

On the Modification of Organisms. By David Syme. 8vo, pp. 164. Price 5s. London: Kegan Paul & Co.

This book can scarcely fail to interest those who follow with attention the course of scientific controversy, for, whatever may be said of its author, he cannot be denied the credit of thinking for himself. A vigorous and ruthless critic of the Darwinian theory, he attacks it boldly all along the line. To begin with, he finds grave fault with the terms in which it is stated by its author—terms which he declares to be unsatisfactory and self-contradicting—"In one place natural selection is the 'struggle for existence'; in another the 'struggle for existence' is said to 'bear on' natural selection; and in a third place he speaks of the 'struggle for existence and natural selection' as if they were independent principles; in one place, again, he defines natural selection as 'the survival of the fittest,' thus confounding cause with effect, and in another place he says that natural selection 'depends on' tne survival of the fittest, while, to add to the confusion, he tells us in another place that 'the conditions of life include natural selection,' inasmuch as they determine whether this or that variety shall survive" (p. 15). The verbal criticism here exhibited is doubtless sufficiently acute, and it is refreshing to find a writer who accurately weighs the meaning of words; but, however loosely it may be stated, Darwin's meaning is by this time pretty well understood, and doubtless the most important portion of Mr. Syme's book is that which deals with the evidence for his conclusions.

To follow the argument, however briefly, would require far more

space than there is at our disposal; suffice it to say that, although in face of Mr. Darwin's infinite store of observations, those of our author may appear somewhat scanty, his deductions from them merit serious consideration, as does likewise his exposure of the weak points in the reasoning of his adversary; while some of the facts which he adduces should make many doubt whether conclusions with which they have grown familiar are so very certain after all. As a compendious instance we may take the question of the cross-fertilisation of flowers. On the authority of Mr. Darwin, it has grown to be almost an article of faith that cross-fertilisation is the greatest boon to a plant struggling for existence, that the services of bees in this direction have been invaluable to plants, and that these have been the great factor in their modification. On every one of these points Mr. Syme demurs. Cross-fertilisation is not, he declares, the boon that is represented; the law of it is more honoured in the breach than in the observance, and those plants which do not adopt it thrive better than those that do: the service of insects is not a clear gain to flowers; on the contrary, these do more harm to them than good,—nor is there any sound evidence to connect the modification of flowers with this cause. How he supports his position must be judged from his own pages; but one remark may be made, namely, that it is very hard in matters like these to get at the facts of a case. We are all aware that the instance of red clover (*Trifolium pratense*) at the Antipodes has constantly been quoted in support of Mr. Darwin's assertion that this plant can be fertilised only through the agency of bumble-bees. Till these were introduced, we have often been assured, the plant continued infertile, in spite of plentiful bloom, but since they came it has produced seed. But a writer in the *New Zealand Tablet* of May 8th, 1891, gives evidence that the clover has been just as infertile since the bees came as it was before; and now comes Mr. Syme to declare that it seeded freely before there were any bumbles, and that one of the leading Melbourne seedsmen (whose name unfortunately is not given) bears witness to having received seed, for seventeen years, from the Western District of Victoria, though there have never been any such bees in that colony. J. G.

ARTICLES IN JOURNALS.

Bot. Centralblatt (No. 43, 44).—P. Kuckuck, 'Zur Kenntniss der *Ectocarpus*-Arten der Kieler Föhrde.'—(No. 45). P. Kunth, 'Die Einwirkung der Blütenfarben auf die photographische Platte.'—F. v. Herder, *Elodea canadensis* in Gouvernement St. Petersburg.'—M. Kronfeld, 'Humboldt über das elektrische Verhalten der *Mimosa pudica* und über Pflanzenathmung.'

Bot. Gazette (Oct. 16).—T. Holms, 'Anatomical Characters of N. American Gramineæ' (2 plates).—G. F. Atkinson, 'Structure and dimorphism of *Hypocrea tuberiformis*.'—J. M. Macoun, 'Notes on the Flora of Canada.'

Botanische Zeitung (Oct. 23–Nov. 13).—M. W. Beyerinck, 'Die Lebensgeschichte einer Pigment-bacterie' (1 plate).

Bull. Torrey Bot. Club (Oct.). — E. L. Sturtevant, 'Some names for *Cucurbitæ*.'—G. F. Atkinson, *Sphærella gossypina*, sp. n. (1 plate).

Gardeners' Chronicle (Nov. 7). — *Picea pungens* (figs. 73, 74). —W. B. Hemsley, *Aristolochia gigas* (fig. 75).—(Nov. 14) *Nerine pancratioides* Baker, sp. n.— (Nov. 21) *Acampe madagascariensis* Kränzlin, sp. n.

Journal de Botanique (Nov. 1). — P. Viala and C. Sauvageau, 'Sur quelques Champignons parasites de la Vigne.'—(Nov. 16). P. v. Tieghem, 'Sur la disposition des canaux sécréteurs dans les Dipterocarpées, les Simarubacées, et les Liquidambarées.' — E. Malinvaud, *Lysimachia thyrsiflora* dans la Haute Loire.'

Journ. Linn. Soc. (Bot. xxviii. 20, 195: Oct. 31). — H. N. Ridley, 'The Genus *Bromheadia*' (*B. sylvestris*, *B. alticola*, spp. nn.: 1 plate). — Id. 'Two New Genera of Orchids from E. Indies' (*Leucolena*, *Glossorhyncha:* 2 plates).—M. C. Potter, 'The protection of Buds in the Tropics' (4 plates). — F. R. M. Wilson, 'Lichens of Victoria' (1 plate).

Oesterr. Bot. Zeitschrift (Nov.). — J. Freyn, 'Plantæ novæ Orientales' (*Ranunculus Sintenisii*, *Gypsophila capillipes*, *Silene Bornmulleri*, *Hypericum Sintenisii*, *H. tomentellum*, spp. nn.).—R. v. Wettstein, 'Die Arten der Gattung *Gentiana* aus der section *Endotricha*.'—E. v. Halacsy, 'Beiträge zur Flora der Balkanhalbinsel' (*Trifolium thessalonicum*, *Edraianthus Wettsteinii*, spp. nn.).— K. Rechinger, '*Hutchinsia alpina* and *H. brevicaulis*' (1 plate).—H. Sabransky, 'Weitere Beiträge zur Brombeerenflora der Kleinen Karpathen.'

Trans. Linn. Soc. (Bot. iii. pt. 4.: Oct.).—G. Murray, 'New species of *Caulerpa*, with observations on the position of the genus' (2 plates).

BOOK-NOTES, NEWS, &c.

Japanese botanists are devoting themselves with much energy to the systematic botany of their country. Prof. Yatabe sends us the first part of *Iconographia Floræ Japonicæ*—a work which is to be for Japan what *English Botany* is for Britain, as it is intended to contain figures and descriptions of all the indigenous plants, cryptogams as well as phanerogams. This first instalment contains twenty excellent plates, with descriptions in English and Japanese: five of the plates are devoted to the forms of the very variable *Saxifraga cortusæfolia*. No systematic arrangement is followed.

We have also to acknowledge three parts (Nos. 7–9 April–June) of a monthly publication entitled *Illustrations of the Flora of Japan*, by Dr. Tomitaro Makino, which is intended to serve as an atlas to

the *Nippon-Shokubutsushi*. Many novelties are described and figured in these three numbers, all named by Dr. Makino:—*Dendrobium tosarense*, *Liparis cornicaulis*, *Cotyledon sikokiana*, *Sedum oryzifolium*, *S. tricarpum*, *Silene Yanœi*, *Habenaria Iinumæ*, *Potamogeton Midhikimo*, *P. nipponicus*, *Saccolabium japonicum*, *Dioscorea nipponica*, *Sarcanthus scolopendrifolius*, *Cirrhopetalum japonicum*.

Our contributor Mr. G. F. Scott Eliot, who left England last month as botanist to the Commission for the Delimitation of the Anglo-French frontier in the neighbourhood of Sierra Leone, issued just before his departure a specimen of a *Flora of Dumfriesshire and Dumfries District*, the principal aim of which is to "extract criticism." Although the pamphlet contains only 33 pages and deals with plants to the end of *Cruciferæ*, there is very full material for criticism, in which, however, the limits of space constrain us to be brief. The principal features of novelty are to be found in the full descriptions of "habitat," and in the list of insect visitors appended to each species,—the latter an interesting new departure, if it can be thoroughly carried out. Other novelties which cannot be commended are the spelling of all specific names with a capital initial; and the introduction of maddeningly unintelligible abbreviations, adopted apparently upon no system, which necessitate a constant (and sometimes unsuccessful) reference to the table of explanations. Mr. Scott Elliot is able to work in so many fields inaccessible to the British botanist that we venture to think he would be wise if he left to others of more limited opportunities the working out of the Dumfries flora.

"Appendix III. 1891" of the *Bulletin of Miscellaneous Information*, printed for the Stationery Office, is devoted to a "List of the Staffs of the Royal Gardens, Kew, and of Botanical Departments and Establishments at Home, and in India, and the Colonies, in Correspondence with Kew." The British Museum is omitted from the list.

Mr. C. A. Barber, late Scholar of Christ's College, Cambridge, and University Demonstrator in Botany, has been appointed Superintendent of the newly formed Botanical Department of the Leeward Islands.

The last volume (xxix.) of the *Bulletin de la Société Royale de Botanique de Belgique* contains a critical review of the species of *Acer*, by A. Wesmael; a paper on the influence of the nature of the soil in the distribution of the mistletoe, by E. Laurent; Algological observations, by E. de Wildeman; New N. American Mosses, by F. Renauld and J. Cardot; Contributions to Belgian Mycology, by Mmes. E. Bommer and M. Rousseau; and papers on Roses, by Prof. Crépin.

We hope to begin in our next number the list of "First Records of British Flowering Plants," upon the compilation of which Mr. W. A. Clarke, F.L.S., has been engaged for a considerable period.

OBITUARY.

In Arthur Barclay, who died at Simla on the 2nd August, Botany has lost a zealous and successful worker. He was born at Edinburgh on the 3rd August, 1852, and received his school education at the International College, Isleworth. He studied Medicine at Edinburgh University for two years and at Glasgow University for two years, gaining at Glasgow the Gold Medal for Botany in 1871. He graduated at Glasgow M.B.C.M. in 1874, and studied for a further period at Wurzburg. In 1875 he entered the Indian Medical Service, and served with the 2nd Central India Horse and 6th Bengal Cavalry. He acted afterwards as Civil Surgeon for a short time at Jessore, and relinquished this post for the Professorship of Physiology at the Medical College, Calcutta. The post he held at the time of his death was the Secretaryship to the Surgeon-General and Sanitary Commissioner with the Government of India: in this office he so distinguished himself that he was appointed Secretary to the Leprosy Commission, and had but concluded his travels with that body throughout India when he was seized with fatal illness at Simla. So much for his official career, to which it may be added that he served in the Afghan War of 1879–80, for which he had the medal with clasp, and was present at the capture of Ali Musjid.

It was during his residence at Calcutta and association with Dr. King and Dr. Cunningham that Arthur Barclay received the first stimulus to research in Mycology—though his interest in Botany had been awake since his student days. His more important earlier papers were published in the *Scientific Memoirs of the Medical Officers of the Army of India*. A few years ago he spent his leave of absence in this country, and made the acquaintance of fellow-workers, in whom his frank and open character and enthusiasm for work roused feelings of friendship and deep interest. On his return to India, Barclay lost no time in showing how amply he could justify the confidence felt in him in the matter of research. Papers from his hand appeared almost at the same time in the *Scientific Memoirs*, in this Journal, in the *Transactions of the Linnean Society*. and in the *Annals of Botany*. Two more, recently read at the Linnean Society, of which he became a Fellow in 1890, are in type, while a third will appear in the January number of this Journal. Barclay has beyond all doubt left his mark in the records of research, especially on the *Uredineæ*. Among so much sound work, it is difficult to select one paper for special comment; but there can be no question that the one of surpassing botanical interest is his paper in the *Transactions of the Linnean Society* on *Uromyces Cunninghamianus*. In it he described a new type of Uredine life-history, with which his name will be associated in all future treatises on the morphology of Fungi,—a fitting memorial of one taken from us in the day of his strength.

George Murray.

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